RAILROAD GAZETTE

FRIDAY, JANUARY 25.

Contributions.

Autographic Testing Apparatus.

STAMFORD, Conn., Dec. 14, 1883.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Engineers having occasion to use testing machines are all interested in the subject of autographic recording appliances, by means of which an autographic card or record can be obtained indicating, if possible, the following particulars, viz.:

1. The modulus of elasticity under different loads.
2. The limit of elasticity.
3. The maximum load causing rupture.
4. The final load at the moment of rupture.
5. The whole stretch of the specimens.
6. The resilience of the specimen, not only at points up to the limit of elasticity, but also up to the point of rupture.
7. The irregularities of elasticity in different parts of the specimen, indicated by a varying elongation (which is not shown at all by any of the existing machines).

Several devices for this purpose have been invented, and are in more or less common use; but a careful examination of them has convinced us that they are all more or less prolific of error, and that their inaccuracies and variations are so serious as to make it an open question whether they do not do more harm than good. The only decided indication they afford is in regard to the elastic limit, the stretch, the maximum and breaking loads. Even these indications we think are not always shown reliably, for reasons which we need not enter upon here. But what the constructing engineer needs chiefly to know is the behavior of his materials before the elastic limit is reached, as it is below this limit that he employs them. Their behavior beyond this point, and up to rupture is of course interesting and instructive, but does not come within the scope of actual practice. The record of existing autographic devices up to the point of elastic failure consists usually of a faint pencil line diverging very slightly from the normal, the amount of this separation at any point indicating the modulus of elasticity of the specimen. These indications, therefore, which are the all important ones to be ascertained, are very faint, poorly defined, and uncertain. The thickness of the pencil line is usually a large percentage of the indication, so that different observers would obtain different readings or indications. Altogether the results thus obtained seem to us so vague and unreliable as to make it a question whether any of the existing recording appliances can safely be used, and whether it is not better, for the present at least, to resort to other means, apparently more crude but actually far more reliable and instructive, to ascertain the action of specimens under strain.

To illustrate our meaning we hand you herewith a blue print showing a specimen which was tested during the recent visit of the American Society of Mechanical Engineers to our works, and ask your attention to the following interesting points it demonstrates. The specimen was originally 30 in. long and 1.4 in. square. It stretched 6.46 in., which is 21.53 per cent. of the whole length. With some autographic appliances the elongation is measured by the separation of the holders (in this case 20 in. originally), which would thus amount to 32.3 per cent. If, however, two points on the bar 20 in. apart were taken as the basis of measurement, their separation was 4.87 in., which equals 24.35 per cent. The two inches adjacent to the point of rupture stretched to 3 in., which equals 50 per cent. If these two inches and their stretch be deducted from the original 20 in., the elongation of the remaining 18 in. was 3.87 in., which equals 21.5 per cent. We have thus five different percentages of elongation according to the basis of measurement assumed. But, by examining the elongation between the several pairs of ordinates, we note that few of them are alike, and that, for instance, the inch marked *A* just outside of the left-hand holder stretched 24 per cent., while the inch marked *B*, in the corresponding position adjacent to the right-hand holder, stretched only 16 per cent., the former being 50 per cent more elongation than the latter.

The preparation of a specimen by ordinates, as we have shown, and the plotting of these after the test, together with repeated direct measurements of the specimen during test by means of micrometer screws applied to measure the actual separation and approach of two well-defined gauging points securely fixed to the specimen, these measurements being made repeatedly under various loads, both increasing and decreasing, and before and after permanent set, undoubtedly afford the most accurate and as yet the only reliable means of noting the action of materials under strain which we at present possess. Ultimately we think it possible that some form of recording apparatus may be devised which will give reasonably complete, accurate and reliable results; but at present we believe that any engineer reasonably well informed as to the behavior of materials under strain can make guesses approximating more closely to the truth as to the modulus of elasticity and the elastic limit than do the average indications of existing autographic recording devices.

This whole subject is of such importance that we have thought you would be interested in the foregoing and in the accompanying drawing, both of which you are at liberty to use as you see fit.

HENRY R. TOWNE,
President Yale & Towne Manufacturing Co.

Better Prospects in the Iron Trade.

The *Iron Age* of Jan. 17. says:

Our market reports have now for some weeks been permeated with a general spirit of hopefulness. The tendency to lower prices seems to have been pretty thoroughly checked in nearly every branch of the iron trade, while in some lines advanced rates have been fixed and maintained. Prominent in the march toward improvement is the steel-rail interest. Only a few weeks ago the price of steel rails was at the lowest point ever touched in this country, and the mills were actively seeking orders, their anxiety to secure work causing the excessive competition which resulted in the low priced contracts referred to. Several of the mills then withdrew from the field, being unable to manufacture as cheaply as the others, who soon received all the orders they cared to take at the low prices then prevailing. The contracts placed for this year's delivery are now stated to aggregate from 700,000 to 800,000 tons, which is very far in excess of the quantity booked a year ago, and is even said to surpass the quantity contracted for at the beginning of any previous year. There are other contracts for rails yet to be placed, and negotiations are being made for them, so that the demand for rails this year exceeds all anticipation. In 1880 the quantity of Bessemer steel rails produced in this country was 852,196 gross tons; in 1881 it was 1,187,770 tons; in 1882 it was 1,284,067 tons; in 1883 Mr. Swank estimates it to have been 1,200,000 tons. The maximum production was reached in 1882, when every mill then existing was run to its full capacity, and a considerable quantity of steel rails was made by iron-rail mills from purchased blooms, which is no longer being done. Since then there has been some increase in capacity, but the withdrawal of several mills from the rail trade has more than offset that increase, so that the actual working capacity is now below that of 1882. Contracts for 700,000 to 809,000 tons of steel rails, therefore, indicate the absorption of over two-thirds of the probable output for this year. It is now confidently expected by steel-rail manufacturers that they will be able to get considerably higher prices for the rails which will undoubtedly be called for in the spring and throughout the summer and fall. An advance of from $2 to $4 per ton has already been established over the lowest rates at which orders have been placed.

Among pig-iron manufacturers there is a decidedly firm feeling. Stocks in first and second hands are very low, and consumers of special grades of iron are, in several instances which have come to our notice, growing somewhat anxious about their supplies. The drooping tendency in the prices of their own products has made pig-iron consumers cautious about purchasing supplies, but the pig-iron manufacturers have met the situation by reducing their production below the actual consumption, as shown in the steady reduction of their stocks which has taken place since the 1st of last July. The period of dullness incidental to the close of the year has been safely passed without any break in prices, and those who expected to secure their supply of pig-iron at lower rates have thus far been completely disappointed. Some consumers have quietly contracted for three and six months' deliveries at present prices, in the belief that pig-iron will not be any lower, and they therefore run no risk of loss, while there is a chance that it may advance and enable them to realize a handsome profit. One very large iron company is authoritatively reported to have already sold almost half of its probable production in this year. Another large company has sold its entire make up to June. Several others have a very considerable part of their output engaged for the first three months of this year. It therefore seems that the firm feeling among pig-iron manufacturers rests on a solid foundation, and that there is no ground for apprehension of lower prices. Buying must soon begin generally, now that January is so well advanced, and if consumers seek to buy in greater quantities than from hand to mouth, as they will do if they find iron is in scanty supply, there must be a considerable improvement in this branch of the iron trade. Manufacturers generally deprecate any great advance in price, but hope soon to see foundry irons selling at $22@$23. A good demand, steadily continued through the year, is more desirable than a sudden spurt which would run prices up to a point that would invite greatly-increased production, to be followed shortly by an overstocked market and another season of dullness and depression.

In other lines it may be mentioned that the wrought-iron pipe manufacturers are maintaining their advanced prices and are having a fair business. Many bar-iron manufacturers are refusing to sell at the rate they willingly accepted before the close of the year. Inquiries are numerous for all kinds of manufactured iron. The price of plate iron is believed to be at bottom, as the mills are very comfortably supplied with orders which will engage their capacity for several weeks ahead, and are in a position to refuse to make concessions. The manufacturers of structural iron are full of orders, and there is plenty of work in sight which has not yet been placed. The merchant steel manufacturers are receiving more orders than has been their experience for several weeks. There is admittedly still room for improvement in several branches of the trade, but the outlook generally is so far from being discouraging that we feel warranted in pointing to the brightening of the skies.

Texas Railroads.

The following summary of the report of the State Engineer of Texas for 1883 is from the Fort Worth *Gazette* of Jan. 19:

Col. J. H. Britton, State Engineer, has submitted his first annual report on the condition of the railways in the state to the Governor. He says:

With a few exceptions the condition of the roads has certainly been very much improved in the last 12 months, more especially the main trunk lines traversing the state. The complaints filed in this office have been comparatively few. The most serious complaints have been against the Missouri Pacific, lessee of the Texas & Pacific Railway and branches, the International & Great Northern and branches and the Missouri, Kansas & Texas and branches. The complaints are for delay in transportation of freight and the irregularity with which they operate their passenger trains. After a thorough investigation, I find that this trouble arises from deficient equipment, more especially motive power. The report shows the condition of the various roads as follows:

Fort Worth & Denver City.—Length 100 miles, in good condition, equipment first-class and fully adequate for all traffic demands. There has never been a complaint made against it.

Missouri, Kansas & Texas.—Length 574 miles, generally in fair condition; new ties and iron are needed in several places on the main line, especially between Denison and Whitesboro. Equipment not adequate to the traffic, and much complaint as to crowded passenger trains on the main line. The Gainesville Branch is not operated to the convenience and accommodation of its patrons, running only one train, and that second-class, at the most inconvenient hours. The citizens of Gainesville donated liberally to the construction of the road, and are certainly entitled to better accommodation than they are receiving.

Texas & St. Louis.—Length 304½ miles. The road from Texarkana to Waco is not in good condition; it needs a great many new ties and some new iron. The equipment is first class. The depots and waiting-rooms, with few exceptions, are good; only one complaint has been filed against the company, and this was remedied when the attention of the Manager was called to it.

International & Great Northern.—Length 891 miles; equipment wholly inadequate to traffic demands; depot accommodation for passengers, with a few exceptions, very poor. Main lines of road in good condition; the branches, with the exception of the Columbia Branch, are in fair condition. This branch, with the exception of the grade, needs to be rebuilt entirely. It is badly operated, having a third-class train three times a week to and from the terminal stations. It would be dangerous to operate it, were it not for the slow speed at which trains are moved. The Georgetown Branch needs heavier iron and many new ties; the Henderson Branch new iron and ties. The Columbus Branch was formerly the Houston Tap & Brazoria Railway, and was sold in 1871 by the state under an act of the Legislature for a debt due the school fund. It was bought by Messrs. Taylor and associates, who executed a bond for $100,000, binding themselves to keep the road in good repair and operate the same. This bond cannot be found.

Houston & Texas Central.—Length 746 miles; main line in good condition, having been relaid with steel rails except about 25 miles. The Austin Branch needs new iron, which, however, the company has in transit. The branch between Waco and Ross needs new iron and ties. With these exceptions the road is in good condition. Equipment very good, and adequate for all traffic demands. Only two complaints, and they were discovered to be without foundation. Depots and waiting rooms very bad, with few exceptions.

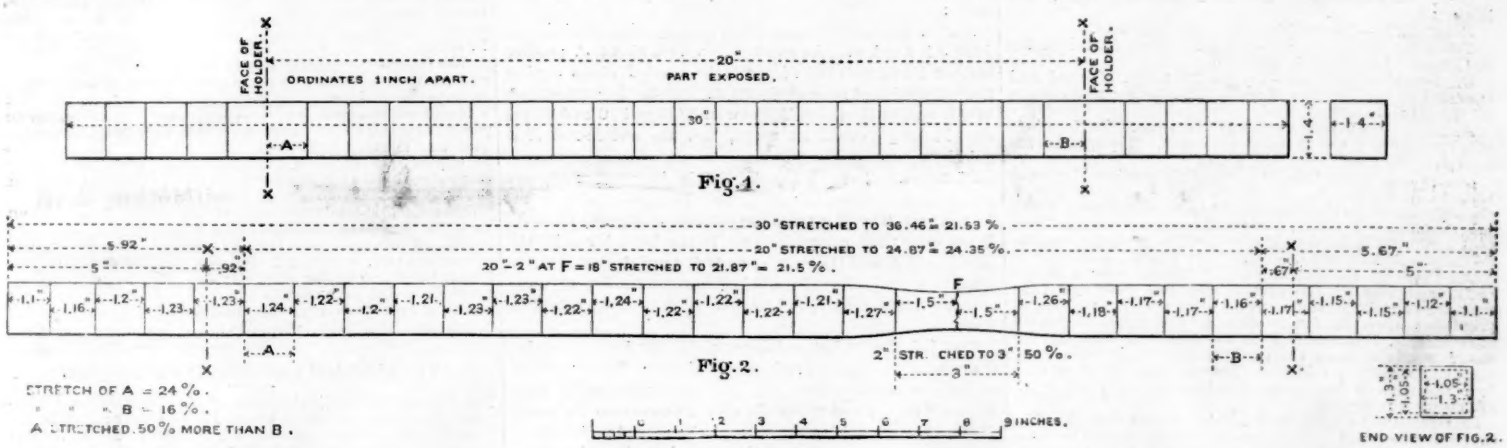


DIAGRAM OF TEST OF METAL BAR.

Texas & Pacific and Transcontinental Branch.—Length 965 miles. The main line from Texarkana to Arlington has been relaid with steel and is in fair condition, but from Arlington to Baird it is in bad condition. The iron is badly worn and many new ties are required. The Transcontinental Division is in very bad condition from Sherman to Paris; thence to Texarkana, it is better, but needs some new iron and ties. From Marshall to the Louisiana state line, about six miles have been relaid with steel, and the remainder needs new iron and ties. From Baird to Sierra Blanco the road is in good condition, but the equipment is bad and wholly inadequate to the amount of traffic.

Galveston, Harrisburg & San Antonio.—Length 1,150 miles. The main line is in excellent condition, with the exception of about 50 miles, which is being relaid with steel. The Harrisburg and Gonzales branches need repair, but I am informed that the latter has been very much improved since my inspection. Other branches in fair condition, equipment first-class, depots and waiting-rooms, with few exceptions, fair. Only one complaint, and that of a trivial nature.

Gulf, Colorado & Santa Fe.—Length 535 miles. This road, except the Dallas Branch, and from Plantersville to Montgomery, is in good condition. The Dallas Branch was hurriedly constructed and very inferior ties and bridge timber was used. Its condition is being improved. Equipment very good; depots and waiting rooms the best in the state. There is some complaint about the manner in which the Dallas Branch is operated in regard to the running of trains and their failure to make connections with the main line.

New York, Texas & Mexican.—Length 92 miles. This road was hurriedly built, but the new management is putting it in good condition. Equipment good, and adequate to traffic demands.

Gulf, West Texas & Pacific.—Length 66 miles. In good condition and good equipment; no complaint.

Texas Western.—Length 52 miles. In poor condition; needs many new ties; equipment adequate; no complaint.

Houston, East & West Texas.—Length 140 miles. In fair condition, and being improved; equipment good.

Texas-Mexican.—Length 168 miles. In fair condition and equipment good.

Rio Grande & Pecos.—Length 25 miles. Traffic confined to transportation of coal.

Texas Trunk.—Length 50¼ miles. Passed into the hands of a receiver in May, 1883; then in very bad condition, but since somewhat improved. Equipment very poor, but new rolling stock in transit, which will supply the present wants.

Gulf & Kansas Short Line.—Length 33 miles. Not inspected.

Galveston, Sabine & St. Louis.—Length 12¼ miles. Not inspected.

Rio Grande.—Length 22 miles. Not inspected.

Texas Transportation Co.—Length 8 miles, from Houston to Clinton. In first-class condition.

Rio Grande & El Paso.—Length 20 miles. Owned and operated by the Atchison, Topeka & Santa Fe; first-class in all the appointments.

Austin & Northwestern.—Length 60 miles. In the hands of a receiver and not in good condition. Equipment too heavy for the road.

Letters are appended from Chief Executive Hays and General Manager Talmage of the Missouri Pacific system stating that measures have already been inaugurated which it is expected will afford early relief against all troubles; that 1,000 additional freight cars have been made for early delivery, and 13 new locomotives are being placed on their Texas roads at the present time. They say that the very early movement of the cotton crop last year taxed the carrying capacity of the roads to a greater extent than in previous years at the same season, and its volume exceeded expectations. To comply with the wishes of every shipper would require to move the crop the first week, hence some complaints are unavoidable. The assurance is given that from this time on their roads will handle nearly all, if not all, business promptly.

In reference to bridges, Mr. Britton says there are 155 of wooden material in Texas, made in their hurry to complete the road's trestle-work, and suggests that the State Engineer be empowered to have such temporary openings as he may desire replaced with permanent structures built of stone, iron and steel. This could be gradually accomplished without working a very great hardship on any of the roads.

The passenger depots at Sherman, Austin and Beaumont are pointed out as a disgrace to the roads and an outrage on the traveling public, which should be abated as a nuisance by the municipal authorities.

The report concludes as follows:

"Section 6 of the law creating the office of State Engineer requires that such Engineer shall prepare and transmit to the next Legislature a complete freight classification and schedule of reasonable maximum rates for freight transportation for each of the railroads operated in this state. To do this, of course it will be necessary for the State Engineer to know how much freight business each road is doing, what it amounted to and what the expense of doing this business was, and this can only be learned from the general officers of each road. This statement should be made and sworn to by the proper officer of each road. The law does not authorize the State Engineer to make any such demands, and he can only request it of the roads, and if any of them decline to comply it will be very difficult for him to make a proper classification. In this connection I will add that all of the roads have cheerfully complied with any request made of this nature, and have offered the State Engineer every facility for inspecting their roads, and at no charge or expense to the state. During the year 1884 I think the railways of Texas will be much improved, especially in equipment and passenger depots. I think they have seen the fallacy of attempting to do a heavy traffic with inadequate rolling stock, especially motive power. There is little prospect of railway construction being resumed to any very great extent during the year 1884."

Dujour's System of Moving and Locking Switches.

The following description of an apparatus for moving, locking and protecting switches by means of the Saxby locking-bar, at one operation, and by the movement of only one lever, which is especially valuable for moving switches at a distance, is freely translated from the *Annales des Ponts et Chaussées* by Clemens Herschel, late Railroad Commissioner of Massachusetts:

In the ordinary way of arranging for the movement of distant switches, one lever moves the switch, another locks it by means of a bolt, (this movement serving, at the same time, to show to the switchman that the switch was properly thrown), and a third lever moves the Saxby locking-bar, when the use of this well-known apparatus is deemed necessary. It must be very apparent, however, that it would lead to a material saving of expense to effect by means of only one lever, and of only one set of main rods, pipes or wires, as the case may be, what is now done by three, or, at the least, by two such sets of power-transmitting machinery. And this is precisely what the Dujour switch movement is claimed to do in an efficient and practicable manner. If it accomplishes this, it is undoubtedly one of those simple contrivances that have come to stay, and in this view has been thought worthy of presentation to the railroad public of the United States.

Instead of two bolt holes through the switch-rod, as customary, the Dujour switch-rod has two notches cut into its upper edge. See *F*, fig. 2. Another bar *G K*, which slides over the switch-rod and is placed at right angles with it, carries two cleats on its under surface *H* and *I*, which fit into and may enter the notches above described, when the two rods are fittingly placed with respect to one another; that is to say, when the switch is properly set for either track. But if the switch be only partly open one cleat or the other will strike against the switch-rod, thus arresting the motion of the cleat-rod, while with the cleat in the notch the former stops the motion of the switch rod.

The description of the action of the whole apparatus is as follows:

The main rod *A*, figs. 1 and 2, takes hold of the middle of the lever *B*, to the ends of which, at *J* and *K*, are attached—

1. The switch points *C C* by means of the bent lever *D* and the switch rod *E*.

2. The bar *G*, having the cleats *H* and *I* on its under surface (see figs. 2 to 7.)

The two articulations *J* and *K* act as centres of rotation or as movable points, according as the switch-rod is held by the cleats or the cleats are held by the switch-rod. When *K* is fixed, the lever *J K* pivots about *K*, and *J* is movable. On the other hand, when *J* is fixed, *K* is thereby made movable and revolves about *J* as a centre.

In the position shown in figs. 2 and 4 the switch-rod *E* is locked by the cleat *H* having entered one of its notches, thus locking the switch. Following now the motions of the apparatus, when the main rod *A* is moved in the direction of the arrow, these motions may be decomposed into three parts:

Part I. The switch-rod *E* being held by the notch *H*, the joint *J* is fixed, and the point *K* revolves about *J*, pushing the bar *G* and the cleat *H* until the cleat *I* abuts against the full section of the switch-rod *E*, fig. 5. In consequence of this motion the point *K* is now at *K'* (figs. 5, 6 and 8), the cleat H has got out of its notch, and the switch-rod *E* is unlocked.

Part II. The bar *G* being stopped in its movement, and the point *K* rendered immovable, the point *J* begins to revolve about *K* until it takes the position *J'* (figs. 6, 7 and 8), at the same time carrying with it the bent lever D, the switch-rod *E*, and the switch points *C*, until the latter strike against the opposite rail; at this moment the notch *F* comes opposite to the cleat *I*, and the bar *G* is no longer held in place.

Part III. The switch-rod *E* can go no further, the point *C* touching the opposite rail, thus making a fixed point of *J'*, while *K* becomes movable. This joint then passes from *K'* to *K''* (figs. 7 and 8) and the cleat *I* passes into its notch *F* (fig. 7), thus locking the switch in its second position.

Thus by one movement of the main bar there has been accomplished: 1. The unlocking of the switch. 2. The movement of the switch, and 3. The locking of the switch in its new position.

A locking-bar requires a movement of given length, parallel with the rail, at each movement of the switch, which is precisely the kind of movement given to the bar *G* in the mechanism above described. The bar *G* is therefore attached to the locking-bar by means of the lever *M* (figs. 2, 5, 6 and 7), which revolves about the axis *O* at one end, and is suitably attached to the locking-bar at its other end. Fig. 1 shows the form of locking-bar and attachment used on the Paris, Lyons & Mediterranean Railroad. Instead of the ordinary parallel-rule motion to elevate the locking-bar, the apparatus shown uses the rollers *Q Q*, and the double-wedged shaped cleats *R.R.* This form of locking-bar motion is reported as doing good service.

During the past 18 months (prior to July, 1883), the above mentioned railroad put into service 250 of the Dujour switch movements, with very satisfactory results. The road intends to apply this apparatus to the operation of all switches on its line that are operated by a signalman from a signal cabin situated some distance from the switch.

In France the cost of a Dujour switch movement, set up, together with the necessary ties or foundation frame work, is 200 francs (about $40), as against 340 francs and 370 francs respectively for two of the switch movements, Vignier's and Saxby's, hitherto in use, without counting the cost of extra levers, and extra room required in the switch-tower. A further economy, varying with the distance of the switch from the switch-tower, is effected in the total length of main rod, which in France is reckoned to cost 12 francs per metre, or about 70 cents per foot.

A Train Delayed by Antelopes.

The west-bound train between Green River and Granger on the Union Pacific, recently encountered a flock of 1,200 or 1,500 antelopes. The snow was quite deep and drifted in places, and the antelopes were running on the road-bed, finding that the easiest road to travel in. When they were first encountered many of them were killed, and the engineer, seeing at once that the train might be derailed unless it were slowed up, decreased the speed. The antelopes kept a short distance ahead of the engine, and were strung along the road for a quarter of a mile. They would occasionally get some distance from the engine, and then they would stop, turn round and watch the headlight until the engine was fairly upon them. They delayed the train half or three-quarters of an hour.—*Elko (Nev.) Independent.*

An Electric Locomotive.

An electric locomotive fitted with the apparatus of Mr. Leo Daft is now running experimentally on the Saratoga, Mt. McGregor & Lake George Railway, a somewhat steep and crooked 3 ft. gauge line 10 miles long, laid with 32-lbs. rails. The following particulars are given in *The Electrician and Electrical Engineer:*

A mile of this road was fitted for electric operation by tightening the joints of the existing track, and laying a special middle rail or conductor upon wooden blocks, which were saturated with pitch to assist the insulation. The additional rail is not an essential feature of the Daft system, but was necessary in the present case, inasmuch as the ordinary rolling stock is required to be in daily use. Starting from the terminus, the track ascends gradually for 600 ft., and then descends for 2,000 more, when a sharp curve and an ascending grade of 93 ft. to the mile is encountered.

The electric motor is of substantial construction, and is apparently designed for heavy work. It bears the name of "Ampère"—a most appropriate one, both in view of the fact that it represents the latest development of the discovery of the illustrious French scientist, and is also the name of the electric unit by which the transfer of electric energy is measured. The motor is 9 ft. 6 in. long, 5 ft. wide, stands 3 ft. above the rails, and weighs 4,500 lbs. The armature and field magnets are inclosed in a box at the rear of the platform, in front of which is the driver's seat and a dash-board carrying three controlling switches and a key-board. The right switch makes and breaks the current, the left switch controls an electric brake, and the centre switch and key-board control the combinations of the coils of the motor answering to the cut-off of the steam locomotive. The reverse lever is on the right. All of these appliances are very conveniently arranged.

The operation of the machine is as follows: Two phosphor-bronze wheels press firmly upon the centre rail by the action of a spring upon their pivoted supports. The current passes from this rail through the wheels to the switches and key-board, thence to the electric engine and through the driving wheels to the outer rails. A counter-shaft communicates motion from the armature to the driving wheels. Double-flanged pulleys and improved belting are used.

The generators are 2 in number, of Mr. Daft's manufacture, each occupying a space 5 ft. by 4, and weighing 1,200 lbs. They were driven by a 25 horse-power Fitchburg engine, and the current led thence to the rails (a distance of about 200 ft.) through underground conductors.

On the day of the trial the motor was attached to an ordinary 10-ton passenger coach, into which 6 passengers (nearly double its ordinary capacity) were crowded, while the motor carried six more, making a total load of about 17 tons.

The "Ampère" started slowly but surely, and ran to the end of the mile without stopping, at the rate of about eight miles per hour. Descending the 93-ft. grade on the return trip a considerable speed was attained, causing the motor to jump the track at the curve, by which accident its running gear was slightly damaged. The trip was made in the presence of nearly 2,000 spectators, many of whom amused themselves by trying to obtain shocks from the track, but the sensation was found to be scarcely perceptible.

Since the first trial the "Ampère" has been run in wet and snowy as well as dry weather, with satisfactory results. The results of this trial show that an electric locomotive under perfect control, weighing 2 tons, will haul an ordinary passenger coach, weighing with its load 15 tons, over heavy grades and sharp curves at a speed of 8 miles per hour, by means of an electric current generated by a 25 horse-power engine and transmitted one mile.

The Electrical Exhibition in Philadelphia.

The Committee on Exhibition of the International Electrical Exhibition to be held in Philadelphia, commencing Tuesday, Sept. 2 next, and closing Saturday, Oct. 11 following, under the auspices of the Franklin Institute, have issued a pamphlet containing full information to intended exhibitors. By a joint resolution of Congress, approved Feb. 26, 1883, all articles which shall be imported for the sole purpose of exhibition shall be admitted without the payment of duty or customs fees or charges, under certain regulations.

The building will be located at Thirty-second street and Lancaster avenue. Each exhibitor will be required to pay an entrance fee of $5, for which a season ticket of admission will be issued. All applications for space must be made before Aug. 30, on printed blank forms, to be furnished by the Committee. Whenever the articles will admit exhibitors are requested to display them in glass cases. The Committee reserve the right to exclude from the building and premises all articles of a dangerous or offensive or otherwise objectionable character. Power will be furnished to drive machines at a fixed rate.

No awards of premiums are offered by the Institute, but in place thereof a report to the Institute will be prepared by a Board of Examiners, which report will be as full as the time and opportunity will permit. The examiners shall be appointed by the Board of Managers, and shall be men of acknowledged integrity, skill and experience in the line of articles assigned to them.

The following railroads and steamship companies have agreed to return free over their own lines to the point of shipment articles which they have carried intended for the exhibition upon which freight to Philadelphia shall have been prepaid: Pennsylvania Railroad Co. (embracing the Philadelphia, Wilmington & Baltimore, Northern Central, West Jersey and Camden & Atlantic roads); Philadelphia & Reading; Lehigh Valley Railroad Co.; American and Red Star Steamship lines; Clyde's Coastwise and West India steam lines· Ocean Steamship Co.; Boston & Philadelphia; Providence, Fall River and Ericsson steamship lines.

Exhibitors who cannot attend in person can authorize the Secretary of the Franklin Institute to place their goods in charge of a suitable person who will represent the exhibitor.

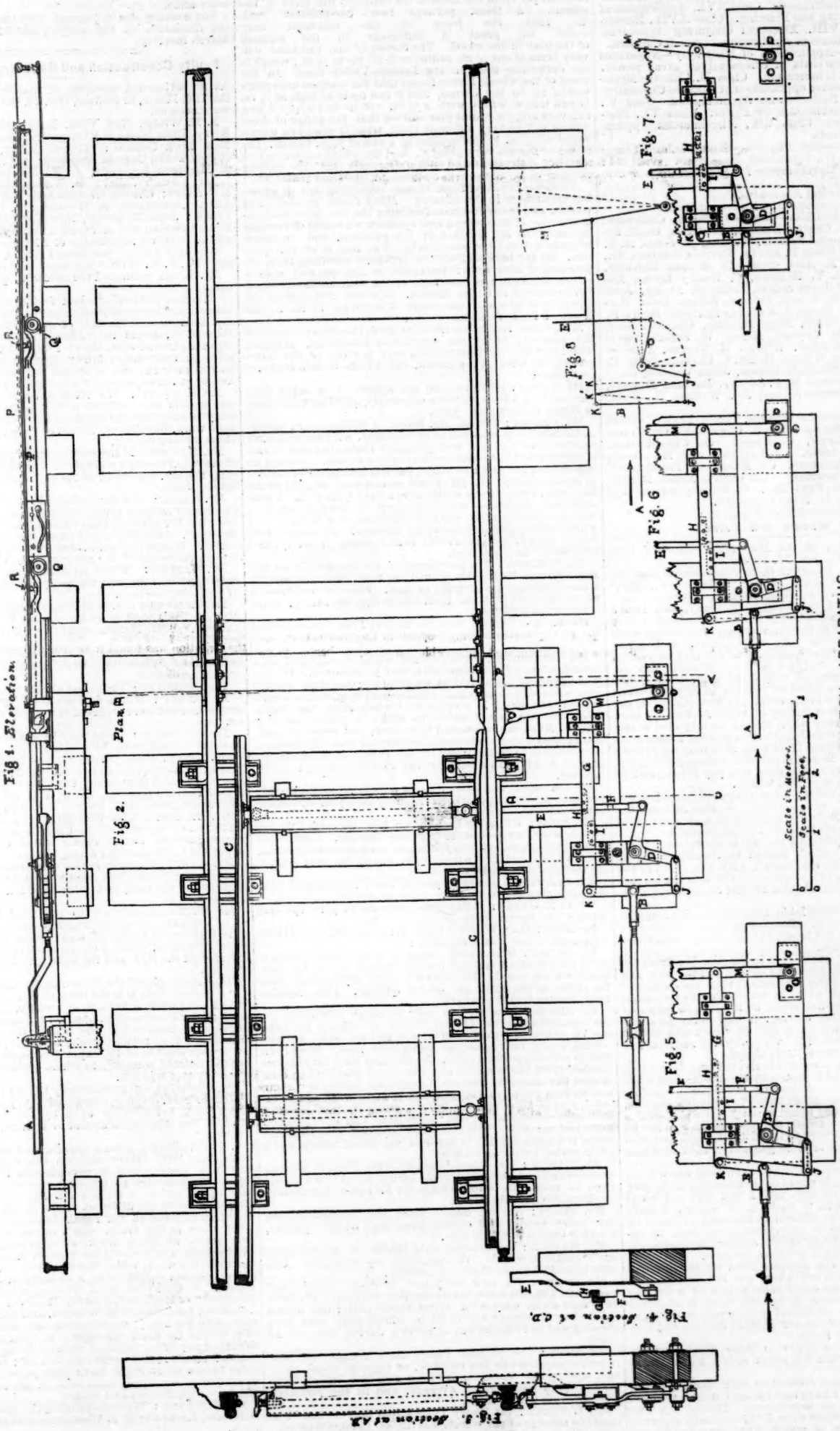
The following is a synopsis of classification:

Section I.—Production of Electricity—Class I, Apparatus for Electricity of High Electromotive Force. Class II., Voltaic Electric Apparatus. Class III., Thermo-Electric Apparatus. Class IV., Magneto-Electric Apparatus. Class V., Dynamo-Electric Apparatus. Class VI., Mechanical Motors—Steam, Gas, Water, Heat and Wind Engines.

Section II.—Electric Conductors—Class I., Telegraph Wires. Class II., Telephone Wires and Cables. Class III., Electric Light Circuits. Class IV., Underground Conduits for Electric Conductors. Class V., Submarine Cables. Class VI., Insulating Materials for Conductors. Class VII., Electrical Joints and Connections.

Section III.—Measurements—Class I., Measurements of Dimensions. Class II., Measurements of Speed, Force and Energy. Class III, Electrical Measurements. Class IV., Photometric Measurements,

Section IV.—A.—Applications of Electricity—Apparatus requiring electric currents of comparatively low power. Class I., Electric Telegraphs. Class II., Telephones, Microphones, Photophones and Radiaphones. Class III., Fire and



DUJOUR'S SWITCH APPARATUS.

Burglar Alarms. Class IV., Annunciators. Class V., Electric Clocks and Time Telegraphs. Class VI., Electric Registering Apparatus. Class VII., Electric Signal Apparatus. Class VIII., Electro-Medical. Class XI., Applications of Electricity to Dentistry. Class X., Applications of Electricity to Warfare. Class XI., Applications of Electricity to Mining and Blasting. Class XII., Applications of Electricity to Spinning and Weaving. Class XIII., Electrical Traps and Snares. Class XIV., Applications of Electricity to Pneumatic Apparatue. Class XV., Applications of Electricity to Musical Instruments. Class XVI., Applications of Electricity to Writing and Printing. Class XVII., Electrical Toys. Class XVIII., Electrical Conjuring Apparatus. Class XIX., Miscellaneous Applications of Small Currents.

Section IV.—B.—Applications of Electricity—Apparatus requiring electric currents of comparatively great power. Class I., Electrical Illumination. Class II., Electro-Metallurgy. Class III., other applications of Electro-Chemistry. Class IV., Storage Batteries and Accumulators. Class V., Electric Motors, Transmission of Power. Class VI., Electro-Magnetic Brakes. Class VII., Miscellaneous Applications of Large Currents.

Section V.—Terrestrial Physics.—Class I., Atmospheric Electricity. Class II., Terrestrial Magnetism. Class III., Apparatus used by Governments for Weather Signal Stations.

Section VI.—Historical Apparatus.

Section VII.—Educational and Bibliographical.

Committee on Exhibitions—Charles H. Banes, Chairman; William P. Tatham, Charles Bullock, Frederick Graff, Joseph E. Mitchell, Samuel Sartain, Washington Jones, A. E. Outerbridge, Jr., William D. Marks, Cyrus Chambers, Jr., Addison B. Burk, E. Alex. Scott, G. Morgan Eldridge, Lewis S. Ware, Wm. V. McKean, C. Wesley Lyons, Edward Longstreth, William Sellers, Frederick Fraley, John J. Weaver, Joseph M. Wilson, Coleman Sellers, Isaac Norris, Jr., Theodore D. Rand, J. Vaughan Merrick, Henry R. Heyl, William B. Cooper, Hugo Bilgram, Charles Fraser, John Baird, Chas. M. Cresson, Horace W. Sellers, David Brooks, Edwin J. Houston, William H. Thorne, Persifor Frazer, Enoch Lewis, William Helme, C. Chabot, Pliny E. Chase, Hector Orr, Robert E. Rogers, Jules Viennot, Luigi D'Auria, S. R. Marshall, M. E. Snyder, Raphael Estrada, N. H. Edgerton, Coleman Sellers, Jr., William H. Wahl, Secretary.

Special Committees—On Finance, Fred'k Fraley, Chairman. On Space, Charles Bullock, Chairman. On Transportation, Enoch Lewis, Chairman. On Classification, Pliny E. Chase, Chairman. On Buildings and Machinery, Frederick Graff, Chairman. On Rules and Regulations, Coleman Sellers, Chairman. On Custom-House Regulations, Charles Bullock, Chairman. On Correspondence and Publication, William H. Wahl, Chairman.

Car Wheels and Axles.

The monthly meeting of the Master Car Builders' Club was held in New York, Jan. 17, 1884.

The President, Mr. LEANDER GAREY, announced that the subject for discussion would be "Car Wheels and Axles," including the seating of wheels to gauge on axles.

Mr. W. W. SNOW, of the Ramapo Company, then read a paper on the subject, advocating a test for wheels before being put into service as the surest means of detecting weak points in the process of manufacture, and maintaining a high standard of quality, which is very necessary, as wheels are now carrying double the load they did formerly with an increase of only 3 per cent. to their own weight. Undue competition as regards price has lowered the quality of chilled wheels, which are now sold at $6 per ton cheaper than the best quality of wheel-making pig iron. A test piece cast on every wheel should be subjected to torsional, transverse, or crushing strains, and the results compared with those obtained from irons shown by experience to give good results. In actual practice, a three year's guarantee is not a safeguard, and does not pay for the serious accidents resulting from broken wheels.

Mr. Snow then referred to some diagrams showing the effect of the form of the head of the rail on the actual gauge of the wheels. We intend to reproduce these diagrams and Mr. Snow's remarks thereon hereafter.

Wheels are often injured by the brake-shoes being made with sharp corners, which should be rounded to ⅝-in. radius, and curved to correspond with the tread of the wheel. Wheel-makers are indebted to the Association for the first steps in bringing about a radical change in this important subject.

Mr. WHITNEY, of Philadelphia, as a wheel-maker, agreed generally with Mr. Snow. There was some difficulty in casting a wheel with a flat tread, but the Sayre tread was a step in the right direction.

Mr. SWEET: A long experience in the wheel business has led me to believe that to produce a good wheel the form and the mode of cooling are more important than the quality of the iron. The heaviest wheel is not always the strongest; if there should be an initial strain on it owing to improper proportions, or defective cooling, it will never be a safe wheel. A cracked bracket is a sign of strain and should condemn a wheel. A wheel set vertically on an iron bed should bear 60 blows with a 30 lb. sledge.

Mr. WHITNEY: Many cracked wheels are found descending steep grades, as the tread is heated by the brake-shoes while the inside remains cool. Annealing does not altogether prevent this. Wheels should be tested by blows on the side, not on the edge. The chill is an important feature, and a wheel may show great tensile strength because it has no chill. It is more satisfactory to test both strength and chill than to rely on a mileage or time guarantee, both of which are difficult to compute.

The PRESIDENT: It is important to have good car wheels, as the breakage of a single wheel on a passenger train may lead to loss of life and property, and I feel sure our wheel manufacturers are anxious to make good wheels. I have here samples of iron from different wheel-makers tested by Professor Thurston, who is unfortunately not here to explain the results, but the old wheels appear the strongest, and the plates show a higher test than the hubs.

Mr. CHAMBERLAIN: The samples tried on the machine show good iron, but we do not know the mileage that the wheels have made. If we could take a test of a certain wheel, and know its mileage, and could have it analyzed and produce a duplicate, we should make a step in the right direction. Can a wheel maker analyze the iron and produce a duplicate mixture?

Mr. SWEET: The strains given in these tests seem unusually high. Gun mixture will break with a tensile strain of 32,000 lbs.

Mr. FORNEY: It appears difficult to make good cast-iron wheels with certainty. I have made some inquiries into the influence of bad wheels on derailments. During the five years previous to 1883 there were 5,337 accidents reported in the *Railroad Gazette*, of which 3,545, or over 66 per cent. were derailments. During the same period 5,191 accidents were reported to the Railroad Department of the British Board of Trade, of which only 410, or less than 8 per cent., were derailments. This difference is too great to be wholly accounted for by the superior condition of the permanent way, and is probably caused by some defects in our wheels or rolling stock. In Great Britain the railway companies are compelled to furnish accurate reports of all accidents, while in this country the only reports kept are those in the *Railroad Gazette*, and probably only one-third of the total number of accidents are reported there. This condition of things is startling and has led me to inquire into the causes. One reason is, I believe, that there is no proper system of gauging. The greatest difference exists in different shops. Mr. Snow has shown you this evening the difference that results simply from the form of the rails and the form of the wheels. I think perhaps few car-builders realize that the form of the rail-head may make so great a difference in the amount of the play of the wheel. The corner of the rail-head will vary from about ¼ in. radius or 5-16 up to ⅝ in., which is the curvature used on the Lehigh Valley road. In the tread of the wheels, I have found that the sharpest curvature was ⅛ in. in the corner, and it ran up to as high as ⅜ in. If you take a wheel with a ⅜ in. radius and apply it to a rail with a ⅛ in. radius you will see that the gauge of those wheels will be very different from what it would be with a wheel of ⅛ in. radius applied to a rail of ⅝ in. radius. The forms of flanges vary greatly, and the whole subject is in a state of confusion and accounts partly for the greater number of derailments as compared with Great Britain.

Accidents resulting from broken steel tires are of growing importance in this country. Many forms of steel-tired wheels, and many methods fastening the tire have been introduced. If this were a new question we would devote our ingenuity to the solution of the problem, and endeavor to make a steel-tired wheel safe. But this is an old question. So far back as 1848 the accidents resulting from the breaking of tires were investigated in Europe, and a most elaborate record has been kept of all such accidents which have occurred in Great Britain. It would certainly be for our interest to study that record of accidents in the British Board of Trade reports.

Mr. Forney read some extracts from the reports, showing the necessity of having continuous fastenings, gripping wheel and tire, and preventing any portion of the latter leaving the wheel, even should the tire be broken into several pieces.

Mr. SWEET: Steel tires do not appear to be safer than our cast-iron wheels, as there are nearly 1,000 broken wheels in Great Britain every year.

Mr. FORNEY: I think Mr. Sweet is wrong as to safety. A broken tire is reported as an accident, whether an injury results from it or not, and probably there are roads in this country which have broken as many in a month. I am not an opponent of the cast-iron wheel, but it is difficult to be certain as to the quality. If all chilled wheels were as good as the best, steel-tired wheels would have a hard time of it. I consider that steel-tired wheels are not as cheap as cast-iron wheels, unless you get 450,000 miles out of a 33-inch tired wheel, which appears above the average. As regards passenger wheels, the paramount consideration is safety, and cost cannot be considered.

Mr. WHITNEY: The percentage of broken wheels on the Pennsylvania Railroad is about 1 per cent., and of these only a small number are actually broken. Steel is doubtless a better material than cast iron, but as regards safety, there is not much difference.

Mr. SNOW.—Captain (now Sir Henry) Tyler recommended the use of American chilled wheels in England as being safe and durable.

The PRESIDENT: Each cracked wheel is regarded as a broken wheel by the inspectors, and is removed. We remove monthly about 100 wheels from our own and foreign cars, and seldom have an accident caused by a broken wheel. Possibly the wheel is sometimes broken after the derailment, but we should strive to make a better cast-iron wheel. Much can be learned from tests, and railroad companies should encourage manufacturers in this. If the cast-iron wheel is to be the wheel of the future it must be improved, and it cannot be improved without thorough investigation.

Mr. DARWIN: The tires on paper wheels occasionally fail, but with 40,000 paper wheels running last year no passenger or car was injured.

Mr. SNOW: Using the best-known iron, we made 190,000 wheels before a wheel broke to do any damage. Equipment was lighter then, but our road-beds were in bad condition. I believe that a chilled wheel, made out of the best iron, is cheaper and safer than any other.

Mr. DARWIN: I should be glad of some information as to the proper coning of wheels.

Mr. C. E. GAREY: A flat tread appears to give the best service, and fewest sharp flanges.

Mr. BLACKALL: Which wheels give the best wear, those with high or low tensile strength?

Mr. SWEET: Iron which stands a high tensile strain is often close-grained and not ductile enough to be the best iron for a car wheel. The hubs are more crystallized than the plates, as the latter are cooled quicker. This explains their greater tensile strength.

Mr. ADAMS: I am glad to hear so many advocates for the steel-tired wheels. On the Boston & Albany we have for 14 years run steel-tired wheels, and we have no iron wheels under our passenger equipment now. Steel-tired wheels are cheaper and safer. No accident with damage has resulted from the breaking of a steel-tired wheel in 14 years. A steel tire shows its fracture a long time before it will go, and an iron wheel, on the other hand, may break at any instant, and go all to pieces. We are using various kinds of steel-tired wheels on our line; some have run over 500,000 miles and many over 300,000 miles, and are still running. There is a large mileage in favor of steel-tired wheels and a great saving over iron wheels.

Mr. FORNEY: Mr. Adams' data as to the relative mileage of steel-tired and cast-iron wheels hardly appear conclusive. Does he make the same mileage for his cast-iron wheels as the Pennsylvania Railroad?

Mr. ADAMS: We use wheels from the best makers, but our heavy grades and curves wear out wheels quickly, whether they are steel or iron.

Mr. MARDEN: We can get only 30,000 or 40,000 miles out of cast-iron wheels. We cannot get up to 50,000. Our road is similar to the Boston & Albany.

Mr. ADAMS: We took out a pair of 42-in. wheels that had made 198,000 miles before the first turning. We have only used 42 in. wheels for about three years; the wheels referred to in mileage are all 33-in. wheels that have been running and have fallen out of service during the last 14 years.

Mr. SNOW: The Pullman Palace Car Co. have the best record of any road in this country, as regards wheel mileage, and in the Northern Division cast-iron wheels have made 50,000 miles on an average, and in the Southern Division over 60,000 miles.

Mr. WHITNEY: Sir Henry Tyler stated that on the Erie road the mileage of car wheels was 55,000 to 60,000 miles.

Mr. MARDEN: The flanges of steel tires must not be allowed to get cut, or it will be impossible to turn them but once; in endeavoring to get a flange, the tire will be turned nearly completely off. The only way to make a steel-tired wheel economical is to watch it well and take it out immediately when it needs turning, or else, if one flange is worn sharp, turn the axle round or prevent it in some way.

Mr. CHAMBERLAIN: There is a great difference in the manipulation of steel tires, as the same amount of carbon will not always give the same result. Why? Because you have hard and soft carbon. Steel wheel-makers analyze an ingot, and mark it 75, 95, 65, or whatever it may be, but in the manipulation of that tire it is either softer or harder, and the only man who can tell the difference is the man that turns them, and if you have got a man of keen perception there you can get two wheels on the same axle that will wear alike.

The meeting was adjourned with the understanding that the discussion on this subject should be resumed at the March meeting.

Faulty Construction and Repairing of Freight Cars.

At an adjourned meeting of master car-builders held at the Tifft House, in Buffalo, Dec. 12, the following gentlemen were present:

F. M. Wilder, New York, Lake Erie & Western; John Kirby, Lake Shore & Michigan Southern; Leander Garey, New York Central; Robert Miller, Michigan Central; Robert Potts, Canada Southern; A. C. Robson, Lake Shore & Michigan Southern; J. W. Marden, Fitchburg; J. S. Lentz, Lehigh Valley; M. Wilder, New York, Lake Erie & Western; Charles Graham and Robert McKenna, Delaware, Lackawanna & Western; J. D. McIlwain, Grand Trunk; John McKenzie, New York, Chicago & St. Louis; E. H. Bowman and A. Strauss, Pennsylvania & New York, and J. P. Hovey, Rochester & Pittsburgh.

Mr. MCWOOD, of the Grand Trunk Railway, being absent, Mr. F. M. Wilder was appointed chairman.

Mr. KIRBY submitted the following question for consideration:

"Suppose the roof of a box freight car blows off while in transit, and by examination of the car it is shown that a few nails through the ends of the carlines are all that held the roof on, should the railroad company in whose possession the car was when the roof blew off be responsible for some contract-shop's faulty construction and replace the roof at their expense, or should the owner of said car take it and be at the expense of replacing the roof?"

Mr. Kirby said: We often lose a roof on a foreign road, and wish it was decided who was responsible. The company running the car should not be liable for contract shops' poor work, but the roof should be replaced at the expense of those owning the car.

Mr. MARDEN: If the roof blows off, simply by the force of the wind through no fault of the railroad company running the car, the owner of the car should fix the car or receive it back.

Mr. GAREY: If a car has been in service seven or eight years, and through rough usage in the train, or because of the wind the party or road running the car should be responsible, unless they could show that the construction was faulty. Where it is self-evident that the construction was faulty, the owner of the car should be held responsible.

Mr. MARDEN: Where no doubt exists as to the faulty construction of the car, the owner should bear the expense of replacing the roof.

The CHAIRMAN: One of our cars with a tin roof got on Mr. Marden's road. As there were faults in the roof, I agreed that Mr. Marden was to repair the car at my expense.

Mr. KIRBY: The case I had in mind was one of faulty construction, where there were only a few nails in the ends of the carlines.

The CHAIRMAN: The owner should be responsible.

Mr. GAREY: Where it is not the fault of the company, and would not have occurred if the roof were properly put on.

The CHAIRMAN: There may be a difference of opinion as to what constitutes faulty construction.

Mr. KIRBY: Many parties get cars built without any inspector to see that they are built right; they are put into line service and they do not know that they are faulty. In a year the cars give out. Now, it is not right for the parties running that car to be held responsible.

Mr. MILLER: I agree with Mr. Kirby, but where it is unsafe to run a car with the roof just hanging on, the company running the car should repair it and charge the amount expended to the parties owning the car.

Mr. GAREY: Regarding the cars owned by trust companies, my practice has been to hold the parties whose initials are on the cars, and so far have found it to work satisfactorily.

Mr. HOVEY: In relation to the wind blowing the roofs off of cars, there are a great many circumstances whereby a tin roof can be blown off a car when it is not the fault of its construction; where a car runs into another and strikes a corner of the roof, and the wind getting under raises the roof off.

Mr. KIRBY offered the following resolution:

"*Resolved*, That it is the sense of this meeting that roofs lost off cars while in transit, and which, upon examination, show faulty construction; namely, the ends of the carlines improperly fastened to the plates, tin roofs improperly cleated down, or rotten carlines or plates; the owner of said car or cars shall be at the expense of replacing the roof, and not the railroad company in whose possession the car was when the roof was lost."

The resolution was unanimously agreed to.

Mr. PETRIE, having charge of the joint inspectors at Black Rock, being called upon by the Chairman to state some of the difficulties he had to contend with, spoke as follows:

1. Cars requiring general repairs, and which are sent to a home shop, often return without the repairs being done, and in a worse condition, necessitating the company having it in possession to do some repairs before the car is safe to be put in a train for home the second time. 2. Repairs done by the different roads in the joint inspection are often slighted at the repair branches, and also small work done in the train, which causes trouble when the cars arrive at Black Rock, as switching out cars there causes delay which would be avoided if there were facilities to do the work, which there are not. 3. Cars owned by private parties should have a designated shop for general repairs. 4. Cars with weak drawing attachments, such as Pittsburgh & Rochester, Central Railroad of New Jersey, Delaware, Lackawanna & Western, and private companies' cars, with but two ⅝ draw timber bolts through the middle sills, should be made stronger. 5. Cars having sheathing damaged are often replaced without being painted, and if painted, numbers and letters are left off; the same is applicable to new doors which have been put on. 6. There is a great deal of wrong material used on all cars, especally in the draw attachments and brakes.

Mr. MCKENNA: We are changing the draw heads on the Delaware, Lackawanna & Western cars at the rate of 50 a week.

The next subject of discussion was weak and overloaded cars, with small journals, running in line service.

Mr. MCKENZIE: On a Western road a list of cars, giving the capacity, was furnished to every freight agent, who was notified as to any change. Such a list would obviate much trouble.

Mr GAREY: Freight agents should have all necessary

information, as they are instructed to load those cars according to the capacity marked on them. Whether this information will assist us much I do not know. Some of our cars are away, and we do not see them for a very long time. The sending of cars home when out of condition is not lived up to, and the sooner the owners realize that the cars must reach home the better it will be for all the parties interested in traffic. Now, if we come together and talk these matters over, and have the inspectors say what their troubles are, and then take hold of it individually and get our officers to help us, which I am inclined to think they will readily do, we can get at the root of this much better.

Mr. KIRBY: There are a few of the roads that we have the most trouble with that do not come into our meetings. Now, if we only get these men to meet here with us, I think we could settle these questions satisfactorily. One of our cars gets started home for repairs; Mr. Garey's inspector, at Buffalo, passes the car, but when it gets to junction point on our line the car will have to be taken by the Lake Erie & Western, and they refuse to take them: we have had as many as 30 of these cars side-tracked. I have had to meet Mr. Cooper and make the best terms I could to get the cars to him.

The CHAIRMAN: We have what we consider a good system for all cars that need repairs, including leaky roofs, etc. A board marked, "To be used in local service, not to be loaded with perishable property," is nailed on the car. These are sometimes line cars; then as soon as we have an opportunity, we repair the cars and take the board off.

Mr. MARDEN: I would favor a resolution to put signs on all line cars with leaky roofs.

Mr. MCILWAIN offered the following resolution:

"*Resolved*, That all cars unfit for interchange traffic be marked 'local,' and the capacity be stenciled on said cars; that the superintendents be requested to instruct all agents in the traffic department not to load such cars to points off the line to which they belong, and that all line cars be plainly marked with the capacity, and that the superintendents be requested to instruct agents not to load cars in excess of the capacity marked thereon."

The resolution was adopted.

The CHAIRMAN: Regarding cars with leaky roofs, I would say that we have been marking a good many foreign cars, "Bad Roofs, Send Home." I think if we passed a resolution to mark all such cars in this way we would do away with a great many of our leaky roofs.

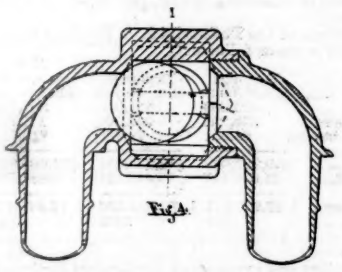
After some further discussion by all the members present, the following resolution was offered by Mr. Wilder:

"*Resolved*, That cars in through traffic, which have leaky roofs, be marked with a sign stenciled, 'Leaky Roof, Send Home,' and that the road responsible for the car be notified of the condition of all such cars." Carried.

The meeting then adjourned until Feb 13, and the members proceeded to inspect a car fitted with the Rote brake.

Improvement of the Westinghouse Air Brake.

Mr. George Westinghouse, Jr., has lately patented a further improvement in his brake, which we illustrate herewith. While the original coupling is retained, duplicate rubber hose are used between the coupling and the iron train pipe. A ball valve works in a tee-piece, which is placed at each end of the hose, and forms the junction between the duplicate hose and the coupling and the iron train pipe respectively. As will be seen from an inspection of fig. 4 this ball valve seats itself and prevents any serious escape of air when a hose bursts. Trains fitted with this arrangement will not be stopped by the automatic action of the brake should a hose give way. The ball-valves will virtually stop the leak by closing both inlets to the damaged hose, and the other hose being available, the train can proceed as though nothing had happened. A train can only be

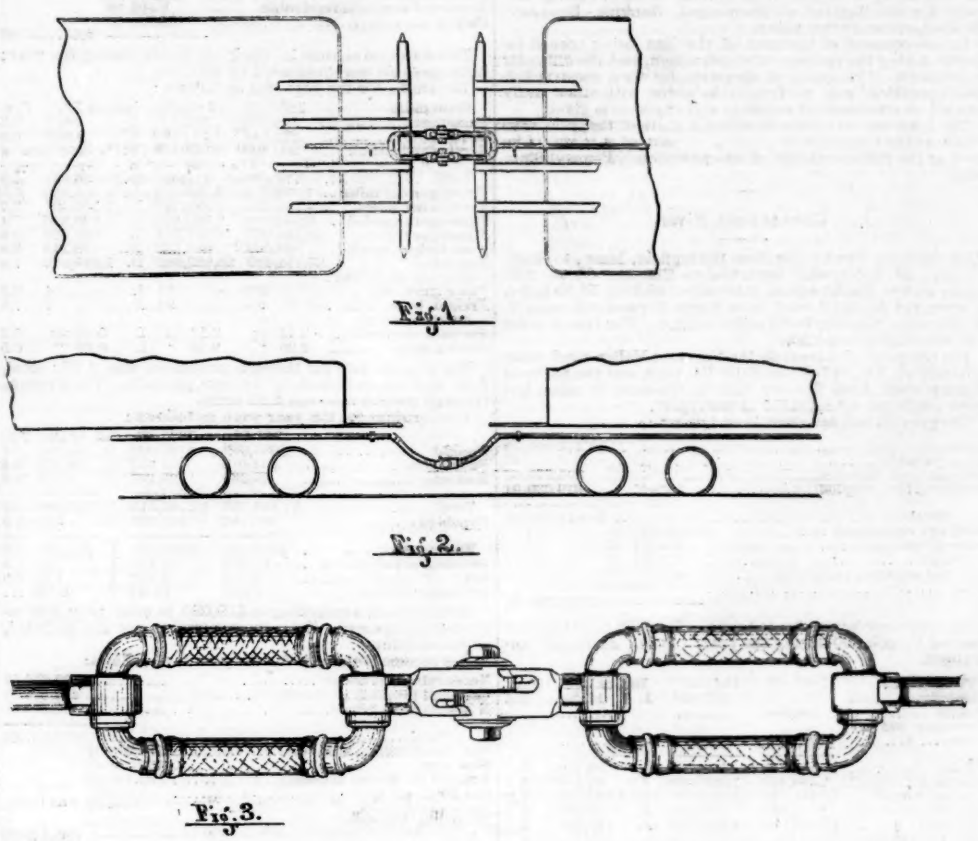


stopped by both hose bursting, which is an unlikely coincidence.

When both hose are in good condition the ball valve will have no tendency to block up either passage, and will maintain a central position, where it will not interfere with the free passage of air through the train. Figs. 4 and 5 show the tee-piece containing the ball valve in detail. The brake pipe or coupling is screwed into the nozzle, which is suitably threaded internally, while the hose are attached to the nipples of the usual form. It is obvious that if the hose attached to the left-hand nipple burst, the ball valve will seat itself as shown, and thus shut off all communication to the defective hose, preventing any escape of air, and leaving free communication open throughout the train by means of the other hose. The brakes would thus be perfectly under control.

In order to prevent the ball valve closing against one of the seats upon the first application of the air pressure to an empty car, a small leakage hole is provided in one of the seat valves, so that if the first rush of air should seat the valve the leakage past the seat will gradually equalize the pressure on each side of the ball valve, and the valve will then have no tendency to close either passage. The leakage should of course be so small that the loss of air when the hose bursts will be insufficient to set the brakes.

A modification is shown in fig. 1, where two tee-pieces or valve boxes are used for each car and four couplings, instead of two, as shown on fig. 3. Four couplings would probably be found somewhat awkward to handle, and the plan shown in fig. 3 seems preferable.



IMPROVEMENT OF WESTINGHOUSE AIR BRAKE HOSE.

Although this arrangement is more costly than the ordinary method of coupling, it effects some saving in the renewal of hose, as they need not be removed until they have actually burst, while under the present system the hose needs careful inspection, and must be removed at the least suspicion of decay, if annoying and unexpected stoppages are to be prevented. As the couplings themselves are unaltered, cars fitted with the duplicate hose will interchange perfectly with those fitted only with the old arrangement.

New York, West Shore & Buffalo Shops at Frankfort, N. Y.

These shops are separate rectangular buildings grouped radially around a 60 ft. turn-table in the centre. This system was proposed by the late Howard Fry, and allows for unlimited extension without interfering with existing arrangements. The raw material is supplied to the shops at the ends remotest from the turn-table, and the machinery has been so arranged that the work passes from one machine to another until it reaches the end nearest the turn-table in a finished condition, ready to be transferred to the erecting shop. The faces of the various buildings are arranged at a radius of 150 ft. from the centre of the table. The storehouse is located in a central position close to the turn-table and between it and the main track.

The blacksmith's shop measures 192 ft. long by 74 ft. wide, and is placed on the east side of the table. It will contain 36 forges, 3 steam hammers, bolt headers, and the necessary punch and shears, and is intended to do only the general run of locomotive blacksmith work. A hammer shop for heavy work will be erected in the spring, and probably the blacksmith's shop will be extended.

The boiler shop is placed next the blacksmith's shop, and is arranged with two riveting towers, one each side. The front end of the shop nearest the table is used for erecting purposes, and the other end for the machines. The whole length of the shop is commanded by two overhead power traveling cranes of 60 ft. span and 15 tons capacity each. There is also an overhead 10-ton power traveling crane in each riveting tower.

The main body of the foundry is arranged with a centre roof 30 ft. span, and two wing roofs 20 ft. span each; two 10-ton traveling cranes, 30 ft. span, run the whole length of the centre portion of the building. Two Colliau cupolas are used, commanded by the overhead traveling cranes, and by a system of 18-in. gauge tracks, carrying metal trucks to supply the portions of the foundry in which the light work is done. On one side of the cupola room is the engine room, containing two No. 6 Baker blowers to furnish the blast for the cupolas and the engine for driving the overhead traveling cranes and moulding machines in the foundry. The hydraulic pumps and accumulators for working the stock hoist and foundry cranes are also placed in this room. To the south of this is placed the brass foundry. On the other side of the cupola room comes the large core oven with a track running out into the foundry. Beyond this is the core room, connecting with smaller core ovens. Between this and the pattern shop are the sand bins.

The pattern storehouse is a two-story building, 74 ft. long by 44 ft. wide, arranged with hydraulic lift in the centre, to command the second floor.

The main erecting and machine shop is arranged with centre span 50 ft., and a wing roof each side 30 ft. span. There are two overhead power traveling cranes 50 ft. span, 30 tons capacity each, running the whole length of this building in the centre span, commanding erecting tracks each side of centre track. The machines are arranged along either side of erecting shop proper. The heavy machinery for doing cylinder and frame work is placed on the north side, and the light machinery on the south side. On the north side, between the lines of heavy tools, runs a standard-gauge track with two walking jib cranes driven by rope. These cranes command the various tools, and transfer the work from one to another. On the south side is another wing 30 ft. span, containing a tool-room and grinding room. These shops are all connected together by a system of standard and 18 in. gauge tracks and turn-tables.

On the opposite side of the main track the round-house is placed, so as to be handy to the freight yard, which is on the opposite side of the main track from the shops.

The paint shop is a one story building arranged to take two engines and tenders on each of its six tracks, and is placed some distance away from the dust and dirt of the other shops.

The office building, which is located on the main street, is two stories high. Ground floor contains the offices of Superintendent of Motive Power, Chief Clerk of Motive Power, Master Mechanic of the shops, and various clerks' offices. The top floor contains the office of the Mechanical Engineer, drawing office, model room, and blue print rooms connected therewith.

The planing mill and freight car repair shops are located about half a mile further to the east of the locomotive shops.

The work of scheming out the designs of these shops was done by Mr. John Player, Mechanical Engineer, to whom we are indebted for the above particulars.—*American Machinist.*

ANNUAL REPORTS.

The following is an index to the annual reports of railroad companies which have been reviewed in previous numbers of the current volume of the *Railroad Gazette:*

	Page.		Page.
Cin., Wash. & Baltimore	46	Philadelphia & Reading	27
Cleveland & Pittsburgh	46	Pittsburgh & Lake Erie	47
Fitchburg	47	Richmond & Danville	23
Lehigh Valley	47	Troy & Greenfield	46
Mississippi & Tennessee	8	Western Maryland	8
Missouri Pacific	26	West Va. Central & Pittsburgh	46
N. Y., N. Haven & Hartford	27	Wilmington, Col. & Augusta	8
Petersburg	47	Wilmington & Weldon	9

Pittsburgh, McKeesport & Youghiogheny.

This new road extends from Pittsburgh, Pa., to New Haven, 58 miles. It has been leased to the Pittsburgh & Lake Erie Co., and will hereafter be operated by that company. The following statements are given in the report presented by President Quincy to the stockholders at their annual meeting last week:

The stock is $3,000,000, all of which has been paid in, except $21,600. The funded debt consists of $2,250,000 first and $750,000 second-mortgage bonds. All of the first and $145,000 of the second-mortgage bonds have been sold. The floating debt, which does not include unsettled claims for right of way, consists of $73,752 bills payable. All interest is paid up to Jan. 1, 1884.

The cost of the road has been as follows:

Right of way	$541,327
Road and superstructure	3,892,179
Buildings, etc	40,084
Purchase of West Yough. Branch, B. & O	300,000
Equipment	375,150
General expenses	225,276
Interest	318,233
Advances to tributary lines	75,000
Total ($94,340 per mile)	$5,472,229

The road has been substantially built, as is shown by the

fact that there has been no trouble with it during all the severe weather of this winter.

The connection with the Pittsburgh & Lake Erie tracks at Twenty-first street (south side), in Pittsburgh, was made July 28. The first freight trains were run Oct. 17, and the road was fully opened for business Nov. 19 last. Large coke shipments have been made, and a considerable traffic is looked for from coke works controlled by parties interested in this road, and from the construction of short branches to reach other works. Coal has been shipped from Scott Haven, Buena Vista and Atlantic, and mines are to be opened at Port Royal and West Newton. Large factories are also located at Homestead, Rankins, Bessemer, McKeesport and other points.

In consequence of portions of the line being opened for traffic during the progress of construction, and the difficulty of accurate adjustment of accounts between constructiob and operation, and of freight balances with other comy panies, no statement of earnings and expenses is given.

The road has been built to secure a share of the great coke traffic of the Connellsville region. A part of it is also to en used as the Pittsburgh end of the new South Pennsylvania road.

Connecticut River.

This company owns a line from Springfield, Mass., to South Vernon, 50 miles, with branches to Chicopee Falls, 2.35 miles, and to Easthampton, 3.50 miles, making 55.85 miles. It leases the Ashuelot road, from South Vernon to Keene, N. H., 24 miles, making 79.85 miles worked. The report is for the year ending Sept. 30.

The company also controls the Vermont Valley road, from Brattleboro, Vt., to Bellows Falls, 24 miles, and the Sullivan County road, from Bellows Falls to Windsor, 26 miles, but these roads are not included in the report.

The general balance sheet is as follows :

Stock		$2,370,000.00
Notes payable		350,000.00
Accounts and balances		304,270.00
Profit and loss, surplus		919,039.91
Total		$3,943,309.91
Road and equipment	$3,796,945 66	
Other investments	105,661.47	
Materials	125.461.18	
Bills and accounts receivable	452.451.91	
Cash	162,789.69	
		3,943,309 91

The company has no funded debt. The bills payable were reduced by $30,000 during the year. Stock remained unchanged.

Tr in miles :	1882-83.	1881-82.	Inc. or Dec.	P. c.
Passenger	314.738	297,470	I. 17,268	5.8
Freight	154,650	.....	.....	....
Switching and service	120.842	.....	.....	....
Total	590.230	550,455	I. 39,775	7.2
Passengers carried.	1,484.155	1,407,069	I. 77,086	5 5
Passenger-miles	15,484,571	14,347,891	I. 1,136,680	7.9
Tons freight carried	632,835	505.621	I. 97.244	6.2
Ton-miles	15,289,258	14,816,233	I. 773,025	5.2
Av. train load :				
Passengers, No.	49	48	I. 1	2.1
Freight, tons.	108	.....	.....	....
Av. rate :				
Per pas -mile	2.87 cts.	2.48 cts.	D. 0.11 cts.	4.4
Per freight-mile	3.05 "	3.07 "	D. 0.02 "	0.7

The average passenger journey was 10.42 miles; the average freight haul, 24.63 miles. The gross earnings per revenue train mile were $1.854; expenses, $1.379, leaving $0.475 as the net earnings.

The earnings for the year were as follows:

	1882-83.	1881-82.	Increase.	P.c.
Freight	$475.250	$454.386	$20,864	4.6
Passengers	366.732	356,403	10,329	2.9
Mail and express	28.056	26,678	1.378	5.1
Total	$870.038	$837,467	$32,571	3.9
Expenses	647,268	615,594	31.674	5 1
Net earnings	$222.770	$221,873	$897	0.4
Gross earnings per mile	10.896	10,488	408	3 9
Net " "	2,790	2.779	11	0.4
Per cent. of expenses	74.40	73.50	0.90	...

Last year the expenses included payments for new construction amounting to $37.595. If this amount be deducted from expenses it would reduce them to 70.08 per cent. of earnings.

The income account was as follows:

Net earnings for the year		$222,760.63
Rents, etc., received		18.572.62
Interest "		22,9 3.99
Total		$264,266.24
Rentals paid	$22,216 79	
Interest "	16,158.16	
Dividends, 8 per cent.	189,600.00	
		227,974.95
Surplus for the year		$36,291.29
Surplus, Oct 1, 1882	$882,591.05	
Sundry additions, net	157.57	
		882,748.02
Surplus, Sept. 30, 1883		$919,039.91

During the year 790 steel rails and 50,280 new ties were used in renewals. Four locomotives, 4 passenger, 1 combination, 1 baggage and 45 freight cars were added to the equipment.

New passenger stations have been built at Willimansett and Chicopee Centre. Land has been bought and plans adopted for a new station at Holyoke, the location of the new building requiring much negotiation. The freight yard at Holyoke has also been enlarged. A new double-track iron bridge over the Connecticut River at Willimansett has been built to replace the old single-track wooden structure.

Contracts have been let for the grading and masonry for a second track between South Deerfield and Cheapside Bridge, and at the same time the road will be straightened and improved. A second track has been laid from North Hatfield to South Deerfield, 4½ miles, and will soon be extended to Old Deerfield.

Providence & Worcester.

This company owns a line from Providence, R. I., to Worcester, Mass., 43.41 miles, with a branch to East Providence, 7 miles. It leased and worked up to the close of the year the Milford and Woonsocket road, 3.88 miles, and the Hopkinton road, 11.55 miles, making 65.84 miles worked. There are on the road owned 42.38 miles of second track and 34.33 miles of sidings. The report is for the year ending Sept. 30.

The equipm nt consists of 34 locomotives ; 40 passenger and 13 baggage, mail and express cars ; 1,850 freight cars. This was increased last year by 6 passenger and 211 freight cars.

The general balance sheet is as follows :

Stock		$2,500,000.00
Bonds		1,242,000.00
Notes payable		456,300.00
Accounts and balances		41,223.40
Profit and loss		417,630.62
Total		$4,657,154.02
Road and equipment	$4,364,869.05	
Materials	126,799.11	
Notes and accounts receivable	9,503.89	
Cash	155,981 97	
		4,657,154.02

There was no change in stock or bonds during the year; notes payable were increased by $36,300.

The traffic for the year was as follows :

Train miles.	1882-83.	1881-82.	Inc. or Dec.	P. c.
Passenger	299.050	305,657	D. 6.607	2.2
Freight	272,544	271,525	I. 1,019	0.4
Service and switch	202,862	234,125	D. 31,263	13.4
Total	774,456	811,307	D. 36.851	4.5
Passenger car miles	1,094.721	1,100,030	D. 5,309	0.5
Freight car miles	4.544.929	4,381,208	I. 163.721	3.7
Passengers carried	2,502,739	2,335.823	I. 166,916	7.1
Passenger-miles	20,585.077	19,977,254	I. 607.823	3.0
Tons freight carried	804,021	882,133	D. 78.112	8.8
Ton-miles	23,174,410	25,023,982	D. 1,849,572	7.4
Average train load :				
Passengers, No.	69	65	I. 4	6.2
Freight, tons	85	92	D. 7	7.6
Average rate :				
Per passenger-mile	2.14 cts.	2 12 cts.	I. 0.02 cts.	0 9
Per ton-mile	2.96 "	2.78 "	I. 0.18 "	6.5

The average rate for through passengers was 2.29 ; local, 2.26, and season tickets, 0.728 cents per mile. The average through freight rate was 2 85 cents.

The earnings for the year were as follows :

	1882-83.	1881-82	Inc or Dec	P.c.
Freight	$686,090	$695.993	D. $9,903	1.4
Passengers	443,016	424,355	I. 18.661	4.4
Mail, etc	29,289	27,167	I. 2,122	7.9
Total	$1.158,395	$1,.47,515	I. $10,880	0.9
Expenses	855,144	855,697	D. 553	0 6
Net earnings	$303,251	$291,818	I. $11,433	3.9
Gross earn. per mile	17.594	17,429	I. 165	0.9
Net " "	4.606	4.432	I. 174	3.9
Per cent. of exps	73.82	74.69	D. 0.78	...

Rentals paid, amounting to $19,080 in each year, are included in expenses. Some improvements are also included, as noted below.

The income statement for the year is as follows:

Net earnings, as above		$303,250.65
Cash and property on hand, Oct. 1, 1882		496,686.97
Notes payable issued		36,300.0
Total		$836,237.62
New construction, land, etc	$236,218.27	
New cars	102,118.42	
Balance of interest account	91,140.68	
Old dividends paid	1.056.00	
Accounts charged off	2,890 68	
Dividends, 6 per cent	150,000.00	
		583,424.05
Cash and property on hand, Sept. 30, 1883		$252,813.57

Additions to property during the year were the purchase of the Lehigh & Wilkes-Barre coal wharves and yards in East Providence, the extension of the second track, the purchase of land in Providence for a new round-house, and the purchase of 6 passenger and 200 coal cars. Improvements charged to expenses include a new passenger-station at Woonsocket, the completion of the shops at Valley Falls, four new iron bridges, 1¾ miles of new sidings, and new electric signals from Boston Switch to Worcester.

The report says: "At the May session of the General Assembly an amendment to charter was granted, authorizing the widening of the location between Woodlawn and Providence for the building of two additional tracks. Work on this important improvement will be commenced as soon as the location has been filed.

"The question of improved terminal facilities in the city of Providence is still an unsettled one, although considerable correspondence has passed between the commissioners appointed by the city and the railroad companies interested; and much time and labor have been expended in devising some satisfactory plan for the improvement that shall not too heavily burden the stockholders of the several roads. Your directors believe that such a plan is feasible, and that it will be adopted and carried out to such an extent as materially to overcome the difficulties which have so long stood in the way of solving this delicate question."

Atchison, Topeka & Sante Fe.

This company has issued a preliminary statement for the year 1883 in advance of the publication of the full report. In this statement the earnings given are the actual figures for eleven months and a close estimate for December, and the comparisons are made with the full report for 1882.

The statement of earnings covers the Atchison, Topeka & Santa Fe proper and the Southern Kansas, the total mileage being 2,218 miles for 1883, and 2,208 miles for 1882.

The earnings of these lines were as follows :

	1883.	1882.	Inc. or Dec.	P.c
Gross earnings	$15,867,669	$16,110,009	D. $242.340	1.5
Expenses	7,650,810	9,361,768	D. 1,710,958	18.3
Net earnings	$8,216,859	$6,748,241	I. $1,468,618	21.8
Gross ear. per mile	7,154	7,296	D. 142	1 9
Net " " "	3,705	3,056	I. 649	21.2
Per cent. of expa.	48.22	58.11	D. 9.89	....

Taxes are included in expenses. The income statement is as follows:

Net earnings		$8,216,859
Track rental	$25.000	
Interest account	105,715	
		130,715
Total net revenue		$8,347,574
Interest on bonds of the Atchison and South Kansas systems	$2,524,471	
Bonds purchased for sinking funds of the two systems	232,604	
Dividend at 6 per cent on Atchison stock	3,414,562	
Discount on $1,500,000 bonds sold in January, 1883	37,500	
Amount paid and due to other roads on foreign pool earnings accounts	430,000	
		6,639,137
Balance for the year		$1,708,437
Which will be used:		
For approximate reduction of the values of material on hand to current prices	$200,000	
In the establishment of a fire insurance fund	250,000	
To the credit of renewal account	500,000	
		950,000
Balance to credit of income account		$758.437

The statement says : "The operations of the two small lines in Kansas owned jointly with the Union Pacific have shown a slight improvement over 1882. That proportion of the interest on the bonds of these roads, for which the Atchison is responsible, is included in the interest account given in the Atchison statement,

"The operations of the Sonora system for the year have not been satisfactory. An epidemic fever raged during six months of the year, seriously affecting all business interests. The expenses of the year were in excess of earnings in the sum of about $80,000. During the year $183,000 in Mexican currency has been collected on account of subsidy. The interest of the outstanding bonds on the New Mexico & Arizona Railroad is included in the interest charges of the Atchison Co. The interest on the Sonora outstanding bonds, having been guaranteed by the Atchison Co. has been advanced by the latter, amounting to $310,240.

"The land statement shows that during the year, 322,221 acres sold for $1,155,633.25. The total amount of cash collected was $1,364,810.62. This was used as follows : In payment of land taxes and expenses of Land Department, $283,934.40; interest on land grant bonds, $202,335 ; in purchase of land income bonds, redeemed and cancelled, $269,446.40 ; in purchase of land grant bonds redeemed and cancelled, $241,116 83; a total of $996,832.63, leaving a credit balance to trust account amounting to $367.977.99.

"A balance of $169,053.60 in hands of land income trustees from 1882 was also used in purchase of land income bonds during this year. All land income bonds are now redeemed and cancelled.

"The capital stock of the company Dec. 31, 1883, remains the same as on Dec. 31, 1882. The funded debt of the company has been increased during the year in the sum of $1,500,000 of Atchison, Topeka & Santa Fe sinking fund secured bonds, which were sold in January, 1883, to meet the immediate requirements of the company arising from advances made for the completion of the New Mexico & Arizona Railroad, and the loan made to the Atlantic & Pacific Railroad.

"On the other hand, the funded debt of the company has been reduced by the purchase and cancellation of the following bonds during the year :

Five per cent bonds	$27.000
Five per cent. sinking fund bonds	38,000
Four and a half per cent. sinking fund bonds	77,000
Six per cent. sinking fund bonds	65.000
So. K. & W. R. R. Bonds	27.000
Sumner County R R. bonds	9,000
Land income bonds	438.500
Land grant bonds	209,000
Total	$890,500

"During the year, the following sums have been spent in improvement of the various roads, and charged to construction :

On the roads in Kansas	$1,241,997.75
" " New Mexico	230.196.40
" road in Sonora	216.064 00
Total	$1,688,2:8.24

"During the year new lines to form branch systems of the main line were determined upon and construction begun as follows: In Kansas, 140 miles, and in New Mexico, 45 miles, making a total of 185. At the close of the year two of these new systems had been completed with mileage 95 miles. The remainder are under way, and will be completed during the first half of 1884. The amount spent during 1883 for the construction of new roads was approximately $1,350,000. A large portion of this amount was realized by the conversion of surplus materials into money."

Philadelphia & Reading.

The annual report of the board of managers, as presented by President Gowen, gives a pretty full summary of the business of this company for the year ending Nov. 30 last, the only portions of the full report lacking being the general balance sheet and some minor statements. The general balance sheet is, however, a serious omission, as no statement of the total debt is given by the President. The report is given in substance below, the figures including the leased lines.

The earnings of the Philadelphia & Reading Railroad Co. for the year were as follows :

	Earnings.	Expenses.	Net earnings.	P.c. of exps.
Railroad	$28,275.937	$14, 69,769	$13,3 6.168	50.8
Canals	923 688	531,916	391,772	57 6
Steam colliers	533,752	353,506	179,846	66.3
Richmond barges	64.951	78.366	*13,715	121.1
Total	$29,797,928	$15,333,857	$14,464,071	51.5
Total, 1882	21,890,117	12,442.521	9,447,596	56.8
Inc. or Dec	I. $7,907,811	I. $2,891,336	I. $5,016.475	D. 5.3
Per cent	36.1	23.2	53.1	....

* Deficit.

The earnings and expenses of the Central Railroad of New Jersey are included above from the date of the lease, June 1, 1883, just half of the last fiscal year.

The earnings, expenses, etc., of the Central Railroad of New Jersey for six months under the lease, from June 1 to Nov. 30, were as follows :

Gross earnings	$6,791.171
Expenses (48.0 per cent.)	3,260,510
Net earnings	$3,530,661
Rental	2,897,179
Profit	$633,482

Deducting these earnings from the statement above, the earnings of the Reading Railroad compare as follows :

	1883.	1882.	Inc. or Dec.	P. c.
Earnings	$23,006,758	$21,890,117	I. $1,116,641	5.1
Expenses	12,073,347	12,442,521	D. 369,174	3.0
Net earnings	$10,933,411	$9,447,596	I. $1,485,815	15.7

The statement for the Philadelphia & Reading Coal & Iron Co. is as follows :

	Earnings.	Expenses.	Net earnings.	P.c. of exps.
Land Dep't	$418.635	$220,970	$197,685	52.8
Coal "	15,354.113	14,816,372	537.741	96.5
Ore "	11,545	4,159	7,386	36.0
Rolling Mill	1,079.888	1,075,586	4,302	90.6
Miscellaneous	174,658	.....	174,658	....
Total	$17,038,859	$16,117,087	$921,772	94.6
Total, 1882	15,410,045	14,209.871	1,200,174	92.2
Inc. or dec.	I. $1,628,814	I. $1,907,216	D. $278,402	I. 2.2
Per cent	10.6	13.6	23.2	....

From this it appears that the net earnings from coal were only 3.5 per cent. of the receipts, while the total net earnings were 5.4 per cent. of the gross receipts.

The total earnings of both companies for the year were as follows :

	1883.	1882.	Inc. or Dec.	P.c.
Earnings	$46,846,787	$37,300,162	I. $9,536 625	25.3
Expenses	31,450,944	26,652,392	I. 4,798,552	18.0
Net earn.	$15,385.843	$10,647,770	I. $4,738,073	44.5
Per ct. of exps.	67.2	71.5	D. 4.3	....

In all the above statements the expenses include nothing

for interest or rentals, the net earnings being the amounts from which those charges are to be met.

The income statement was as follows :

Net earnings of Reading Railroad Co		$14,464,071
Interest	$5,689,240	
Rentals	6,412,427	
		12,101,667
Surplus for the year		$2,362,404
Net earnings Reading Coal & Iron Co	$921,772	
Interest on all obligations not held by Reading Railroad Co	1,126,943	
		205,171
Balance, surplus for the year		$2,157,233

This surplus compares with that of $882,942 for the previous year. The Reading Coal & Iron Co. thus shows a deficiency of $205,171 in meeting interest requirements.

The total surplus above was sufficient to pay 7 per cent. on the preferred and 6 per cent. on the common stock and leave a balance of $57,635 applicable to the deferred income bonds.

The operations of the leased lines have been generally satisfactory, and the following increases have been made in gross earnings : Catawissa, $2,180 ; Philadelphia, Germantown & Norristown, $73,074; North Pennsylvania, $117,542; Delaware & Bound Brook, $31,816.

The Express Department shows a profit for the year of $173,175, against $138,115 in 1882.

The steam colliers show a profit of $179,845, against $271,548 in 1882, the decrease being partly due to the loss of the services of the "Pottsville," which went aground on the New Jersey coast Jan. 9 and remained there until Oct. 26, and did not enter into service again till Nov. 15, owing to repairs needed.

TRAFFIC.

The comparative traffic returns of the Reading Railroad Co. are shown in the following table, the traffic of the Central Railroad of New Jersey for six months from June 1 being included in the year 1883 :

	1880.	1881.	1882.	1883.
Passengers carried	9,822,422	10,561,853	12,027,470	18,195,264
Tons of coal, 2240 lbs	7,179,399	8,072,142	8,429,826	11,449,373
Tons of merchandise, 2000 lbs	5,144,044	5,965,818	6,404,709	7,159,682
Tons of Co. merchandise, materials, 2000 lbs	741,036	849,417	1,085,674	1,257,106
Total tonnage of Co. (2000 lbs., including weight of passengers and Co. materials	14,842,706	16,841,807	18,054,351	22,938,311

For purposes of comparison the following table, showing traffic returns for the six months ending Nov. 30, 1883, of the Central Railroad of New Jersey under the lease, is annexed:

Coal tonnage	2,857,497
Merchandise tonnage	1,574,456
Passengers carried	5,393,335

The total coal tonnage of the estates of the Reading Coal & Iron Co. as compared with that of the previous year, is shown in the following table:

	Mined by Co.	Mined by tenants.	Total.
1883	4,582,667	1,491,465	6,074,132
1882	4,111,830	1,512,959	5,624,789
Increase	470,837		449,343
Decrease		21,494	

The actual cost of mining and delivering coal into railroad cars for the year was $1.495, as against $1.473 for the year 1882, and $1.497 for the year 1881.

LEASES.

The report says : "The Jersey Shore, Pine Creek & Buffalo Railway, referred to in the last annual report, was completed and opened for traffic during the summer last year.

"The Shamokin, Sunbury & Lewisburg Railroad was opened for business on July 1 last, and for the first five months earned over and above all expenses about one half of the interest upon its first-mortgage bonds—a gratifying result for the opening months. It is not doubted that with the increasing western traffic thrown upon the line it will soon earn a full interest upon its cost. The line has been constructed in a most substantial and durable manner, and, though laid as a single line, has double track bridge masonry, and culverts throughout.

Its entire cost has been		$2,489,108
For this the company has received the entire capital stock	$1,000,000	
First-mortgage 5 per cent bonds	1,000,000	
		2,000,000
Leaving a balance of		$489,108

"For this balance second-mortgage bonds will be taken. The line is being operated under lease to the Philadelphia & Reading Railroad Co., which provides for the payment of an annual rental equal to the interest upon its obligations, and 6 per cent. upon its stock. Of the first-mortgage bonds of $1,000,000 the company has sold $787,000, which realized $738,380 in cash. The construction of the Jersey Shore, Pine Creek & Buffalo, and of the Shamokin, Sunbury & Lewisburg has opened communication between the lines of the New York Central & Hudson River Railroad Co. and those of this company. A very large traffic is expected to be developed by these lines, and the future of the Philadelphia & Reading Railroad Co. cannot but be greatly benefited and improved by a close and friendly alliance with such an important company as the New York Central & Hudson River.

"The South Pennsylvania Railroad, connecting Harrisburg and Pittsburg, and referred to in the last annual report, has completed its organization, located and revised its line, and made very satisfactory financial arrangements for the money required for construction. The tunnels and the masonry for the bridge over the Susquehanna River are under contract. Some 70 miles, embracing the heavy work, are to be placed under contract during the present winter, and the remainder will be contracted for in the coming spring. It is expected that the entire line will be in operation within two years.

"Another very important railroad connection has been provided for since the date of the last annual report. The Beech Creek, Clearfield & Southwestern Railroad Co. has located and is rapidly constructing a line of railway from a point near Jersey Shore, upon the Jersey Shore, Pine Creek & Buffalo Railroad, to the Clearfield bituminous coal region of Pennsylvania. Large bodies of valuable bituminous coal lands have been secured in the interests of this line, and a very large traffic is expected from the coal operators of the Clearfield region, which already produces an annual output of 3,000,000 tons. The new line is expected to be opened for business during the coming spring, and its entire tonnage to Philadelphia and New York and all points south and east will be thrown upon the lines of the Philadelphia & Reading Railroad Co. under a contract for 900 years, which provides for a pro-rate of joint charges between the several connecting lines.

"The Baltimore & Ohio Railroad Co. has located, and is constructing, in the name of an auxiliary company, an important line of railway from Baltimore to Philadelphia, which, when completed, it is expected will connect with the lines of the Philadelphia & Reading Railroad Co., and throw over the latter to New York a very large traffic from Baltimore, Washington, the South and Southwest. To form a connection between the railway systems of the company on the north and those on the south of the city of Philadelphia two lines of railway have been located, known as the Schuylkill River East Side Railroad Co. and the Schuylkill River West Side Railroad Co., all the stock of each of which companies is held by the Philadelphia & Reading Railroad Co. When constructed these lines will serve to connect all the lines of the company running north, east, and west with those running south from Philadelphia, and afford access to the large traffic expected from the lines of the Baltimore & Ohio Railroad Co and its many connections.

"During the year the company has acquired control, by a lease for 999 years, of all the railroads and property of the Central Railroad Co. of New Jersey, at a rental of 6 per cent. upon the capital stock of the lessor company, beginning to run three months after the commencement of the lease, thus reducing the rent for the first year to 4½ per cent. The operations of this leased line for the first six months have resulted in a net profit to the company over and above the rental of $633,483; but this cannot be taken as a fair estimate of the immediate future: first, because the company operated the line for the first three months without paying any rental upon the shares; and, second, because the six months ending Nov. 30 are the most profitable of the year, and the succeeding winter months cannot be expected to show earnings sufficient to pay the monthly rental. No doubt is entertained, however, of the ability of the company to earn upon the leased line in each year amply sufficient to pay the rental ; and the possession of the property, affording an outlet with abundant terminals at New York harbor, and the consequent control of its large coal traffic, is of vast importance to the future of the company. At the instigation of parties acting in the interest of the Pennsylvania Railroad Co., Mr. William B. Dinsmore, President of the Adams Express Co., who is a stockholder of the Central Railroad Co. of New Jersey, and, as such, voted in favor of the lease, has been induced to file a bill in equity to set the lease aside. No danger whatever is apprehended from this attempt, as the legal right to make the lease is undoubted.

"On April 11 last the company leased for a term of 999 years, from May 1 last the railroad of the Schuylkill & Lehigh Railroad Co., at a rental of 4½ per cent. upon its first-mortgage bonds, and 6 per cent. upon its capital stock. All of the capital stock belongs to the Philadelphia & Reading Railroad Co. Upon the first-mortgage bondholders consenting to reduce the interest on their bonds to 4½ per cent. the lease was made, the Philadelphia & Reading Railroad Co. agreeing to accept second-mortgage bonds for $400,000 of the first-mortgage bonds previously held by them, so as to reduce the amount of the first mortgage to $600,000. The line of railroad extends from High's Farm, below Reading, through the latter city to a point of connection with the Lehigh Valley Railroad near Slatington, Pa., a distance of 44 miles.

COAL & IRON CO.

"During the year the construction shops of the company at Reading, including the locomotive and car shops and foundry, have been transferred to and placed under the management of the Reading Coal & Iron Co.

"The large increase of indebtedness by the Reading Coal & Iron Co. to the railroad company, as shown by the balance sheet, is due :

"First, To the conversion and funding of the bonded indebtedness of the former into the first and second series 5 per cent. consolidated mortgage bonds of the latter.

"Second, To the charge against the former of the value of materials and supplies connected with the shops and transferred by the latter.

"Third, To the amount expended by the former for the purchase of coal lands and collieries, the payments of valuations of colliery property to tenants upon the termination of their leases, and to the construction of locomotives and rolling stock.

"Fourth. To the amount of receivers' certificates and floating debt of the former company paid off by the latter.

* * * * * * *

"An arrangement has already been entered into by all the anthracite companies for a suspension of mining during 39 days in the months of January, February and March. As the winter is the proper time to suspend work, and as the 39 days of idleness already provided for, in addition to the 9 days of idleness in December, 1883, should be sufficient to avoid surplus production prior to the end of the present fiscal year, the prospect of a very remunerative business for eight months' full work during the coming, as against but four months of full work during the past year, is a very fair one. The profits for December, January, February and March of the present fiscal year, due to the greater length of suspensions, should be less than those of the same months of last year, but any loss so incurred should be much more than made up by the increased earnings of April, May, June and July.

FUNDING OPERATIONS.

"The car trust of $2,000,000, bearing interest at 6 per cent., referred to in the last annual report, was created, the certificates sold for 98½ per cent. cash, and the proceeds applied to the payment of the receivers' certificates of both companies."

Under the circular of June 27, 1883, there has been funded into convertible adjustment scrip $2,209 940 of scrip and coupons; funded into 5 per cent. consolidated bonds, first series, $2,379,292 ; funded into 5 per cent. consols, second series, $1,689,587.

"In addition to the old obligations so funded into the new, the managers have bought for the company the following overdue obligations, viz. :

Deferred coupon dollar scrip, etc	$824,075
General mortgage and Perkiomen sterling scrip	652,050
Income mortgage bonds	240,000
Total	$1,716,085

FLOATING DEBT.

"In addition to the earnings of the company, all the money required for the purchase of the above securities; for the completion of the Shamokin, Sunbury & Lewisburg Railroad, $1,731,000; for the purchase of additional coal lands and collieries, and for the construction of engines and cars by the Reading Coal and Iron Co., about $1,200,000; for payment on account of purchase of Central of New Jersey stock, hereafter referred to, say $510,000, and for other capital accounts, has been supplied by increasing the floating debt of the company; the managers believing that so long as money could readily be obtained at not over 6 per cent. with the abundant collaterals they had at their disposal, it was better to make temporary loans at 6 per cent. interest than to sell at the then market prices the balance of the convertible adjustment scrip, or the issued income mortgage bonds, or any other funded obligations, the sale of which would involve the payment of a higher rate of interest for any great length of time. The entire floating debt of the Reading Railroad Co. is, as of Jan. 10, $6,754,291, in addition to this, there is due by the company $3,460,311. balance of the purchase of 50,000 shares of the Central Railroad Co. of New Jersey, bought at an average price of $78.04 per share. As the stock of the Central Railroad Co. of New Jersey is now a guaranteed 6 per cent. stock, and represents to that extent an obligation of the company, the purchase of 50,000 shares at this price was considered highly advantageous.

"The floating debt of the Reading Coal & Iron Co. being much less than the value of the coal and quick cash assets on hand applicable to its payment, requires no attention.

COLLATERAL TRUST LOAN.

"Of the issue of income mortgage bonds, which by the terms of the mortgage must be redeemed out of the earnings of the company before any dividend can be made, there are still outstanding $2,141,000. The difference between this sum and the amount of $2,454,000, as shown in the balance sheet, $313,000, represents the amount already bought by the company. The managers deem it advisable that the floating debt of the railroad company, the balance due upon the purchase of the 50,000 shares of the Central Railroad Co. of New Jersey, and the outstanding income bonds, should be paid as soon as possible, and, to provide the means of doing so, they recommend the creation of a collateral trust loan of $12,000,000, in 50-year coupon or registered bonds, bearing interest at 5 per cent. per annum, and secured by the deposit of the following stocks and bonds:

"Stocks—Central, of New Jersey, $5,000,000; East Pennsylvania, $1,136 350; Shamokin, Sunbury & Lewisburg, $1,000,000; Mine Hill & Schuylkill Haven, $352,150; East Mahanoy, $249,000; Junction R. R., $86,200; Mill Creek & Mine Hill, $48,175; Mount Carbon & Port Carbon, $38,800; Schuylkill Valley, $62,300; Tidewater Pipe Co., special certificates, $373,000; do. do. trustees' certificates of voting stock, $235,500.

"Bonds—P. & R. R.R. Co. income mortgage (to be stamped with release of sinking-fund clause and of obligation to pay out of earnings), $5,000,000; Preston Coal & Improvement Co., first mortgage, $1,000,000; Reading & Columbia, $1,000 000; Tremont Coal Co., first mortgage, $900,000; Central New Jersey convertible debentures, $600,000; Shamokin, Sunbury & Lewisburg first-mortgage, $213,000; do. second mortgage, $489,000; Tidewater Pipe Co. mortgage, $297,000; Mam. Vein Coal & Iron Co. first mortgage, $223,000; Locust Dale Coal Co. first mortgage, $156,000; Perkiomen R.R. Co. first mortgage, $135,000; do. freight, $50,000; Philadelphia, Reading & Pottsville Tel. Co., $200,000; total, $18,934,475.

"As the value of these securities is over 50 per cent. above the principal, and the annual income earned by them much more than double the annual interest upon the bonds to be secured by their deposit, it is believed that the proposed loan can be readily sold at a fair price. By the purchase of 50,000 shares of Central Railroad Co. of New Jersey stock, and by the issue of the proposed loan, the fixed charges of the company will be reduced as shown below, assuming the loan to be sold at par.

There will be saved :

Interest on 6½ per cent. upon, say, $6,400,000 floating debt	$416,000 00
Interest at 7 per cent upon $2,141,000 income bonds	149,870 00
Revenue received from 50,000 shares Central of New Jersey	300,000 00
Total	$865,870 00
Deduct interest on proposed loan, 5 per cent. on $12,000,000	600,000 00
Balance showing reduction of fixed charges to the company equal to 0.77 per cent. on capital stock	$265,870 00

"Interest at 6½ per cent. upon the floating debt is believed to be a fair estimate, considering the rate of bank discount and brokers' commissions, which necessarily must be paid upon a portion of the debt.

"In addition to the proceeds of the proposed loan, the company has on hand nearly $3,000,000 in value at the issue price of the unsold deferred income bonds. As something has been earned toward the interest upon these bonds during the past year, and as any increased earnings in the future must cause a rapid appreciation in their market value, there should be little difficulty at the proper time in realizing, as it may be required by the future wants of the company, an amount equal to the original issue price of 30 per cent. upon the whole of the unissued deferred income bonds, provided it may not be considered either safer to hold them for a much higher price or to avoid their issue altogether.

DIVIDENDS.

"The question of present and future dividends upon the stock of the company will doubtless be of interest to the stockholders. For the last three years a dividend of 7 per cent. upon the preferred stock has been earned; and as such dividend when earned is of the nature of a debt and cumulative, the managers see no reason why the arrears should not be paid. With reference to dividends upon the common stock the case is different. The income account of the company, after crediting the net earnings of the year 1883, will only be in credit to the amount of $610,190.38, due to the fact that the losses for the years preceding 1881 are still charged to that account, which now stands thus:

Credit.		
Profits of 1881	$183,256	
Profits of 1882	882,942	
Profits of 1883	2,157,233	
		$3,223,431
Debit.		
Losses prior to 1881		2,613,240
Credit balance		$610,191

"The debit of $2 613,240, representing the losses of years prior to 1881, could, if the shareholders so ordered, be charged to capital against the very much larger amounts of income that from time to time in previous years have been expended for capital accounts without any charge whatever to the latter. If this is done there remain but two obstacles to a dividend upon the common stock : First, the necessity of paying the outstanding income bonds with the net earnings, and second, the existence of the floating debt, which, so long as it exists, would seem to require the conservative policy of husbanding all the resources of the company. As both of these difficulties would be surmounted by the sale of the proposed new collateral trust loan, and as its effect will be to reduce the fixed charges of the company without increasing the amount of its obligations, the managers submit to the shareholders the decision of the question whether a dividend shall or shall not be declared in case the proposed loan is sold and the proceeds realized by the company. * * * *

"The managers have to congratulate the stockholders upon the improved condition and prospects of their property, and they desire to take this opportunity of extending their thanks to all of the officers and subordinate employés now in its service, whose zeal, efficiency, fidelity and discipline have so greatly contributed to the gratifying result that has at last been accomplished, notwithstanding all the vicissitudes through which the company has passed during the last four eventful years."

RAILROAD GAZETTE

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EDITORIAL ANNOUNCEMENTS.

Addresses.—*Business letters should be addressed and drafts made payable to* THE RAILROAD GAZETTE. *Communications for the attention of the Editors should be addressed* EDITOR RAILROAD GAZETTE.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in rail road officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

NEW YORK CENTRAL EXPENSES.

The New York Central & Hudson River Railroad had less traffic last year (the year ending with September) than the year before, but there was an increase of 7 per cent. in its working expenses, amounting to $1,354,620, which alone is equal to $1.51 per share of stock. The expenses were also larger than in 1881, when the freight traffic was larger than in 1882 even. It will be interesting to learn where this increase of expenses has been. The report gives them in detail, and from it we see that the increase over 1882 was nearly all in maintenance expenses, $573,351 (14 per cent.) more having been spent in maintaining the road and structures, and $553,150 (15 per cent.) more for maintaining rolling stock and machinery, while there was an increase of less than 2 per cent. in all the other expenses, which are summarized under the head of "operating the road." This very large increase in maintenance expenses was made without increase in mileage and with but a very small increase in rolling stock, and, as we have said, with a decrease in traffic, though it should be added that there was an increase of 3¼ per cent. in train mileage, which was slightly larger than in 1881 also. The expense per traffic train-mile for six years has been:

1878.	1879.	1880.	1881.	1882.	1883.
$1.01	0.96	$1.07	$1.12	$1.18¼	$1.23½

The recent increase has not been due to larger train-loads, for the largest average freight train load varied only from 217 to 219 tons in the three years ending with 1882, and in 1883 it was 9 per cent. less than in 1882, and the maximum passenger train load was in 1882. The average length of haul of freight, however, was the smallest in 1883 that it has been since 1872, and the average journey was a trifle less than in the two years next preceding. This means that a smaller proportion of the smaller traffic was through. And from a very interesting statement given in the last report for the first time, which shows what the through freight has been ever since 1871, we see that it was smaller in 1883 than in any other year since 1877—14 per cent. less than in 1882 and 27 per cent. less than in 1881. Nearly the whole decrease in freight has been in this through freight, leaving the other freight with comparatively little change, though there has been some decrease in that too, it being in 1883 4½ per cent. less than in 1882, and 9½ per cent. less than in 1881. But this other freight is not all local; it includes the New England through freight, and if that has decreased in anything like the same proportion as the New York through freight, the local freight last year must have been larger than ever before.

But let us return to the working expenses. The *average* expenses may well be larger when a larger proportion of the business is local (36 per cent. of the New York Central's was through in 1883, against 39 per cent. in 1882, and 41 in 1881); but we cannot charge this road's increase in total expenses last year to this, because, though the local freight was a larger proportion of the whole, it was a smaller amount. Moreover, as we have said, the increase in expenses was not to any extent for conducting transportation, which is likely to vary with the nature of the traffic, but in the expenses for maintenance, which should be little or no greater for local than for through business.

In maintenance of road there was the very great increase of 72¾ per cent. in the cost of the rails renewed, which cost, however, is but 19 per cent. of the total cost of maintaining road, and only 3½ per cent. of the total working expenses. Much has been said of the reduction in expenses which the reduction in the cost of rails would cause; but the difference between the $80 per ton paid at the beginning of 1880 and the $35, which is the price now, would make a difference of only $333,000 on the New York Central's exceptionally large consumption last year, which is but 1⅛ per cent. of its total expenses. On the consumption of the previous year it would be less than $193,000, which was 1 per cent. of the total expenses. Last year the average cost of new rails per mile of *track* worked was about $270, which would have paid for about six tons of rails. At this rate the track would be renewed in about 16 years, and this is probably a longer life than can be counted upon under the New York Central's traffic. We therefore conclude that the increased expenditure for rails last year was not because renewals were above what will be required on the average, but because in 1882 they were less than the average requirements. But it has been a long time that the expenditures for new rails have been extremely light. We give them below for six successive years:

Year.		Year.	
1877–78	$372,406	1880–81	$566,767
1878–79	221,755	1881–82	417,04[illegible]
1879–80	416,348	1882–83	720,618

Thus the expenditure this year was much greater than in any other of the six, though, as we have said, it was probably less than it must be on the average. In these six years, judging by the expenditure and the price of rails, there cannot have been more than 54,000 tons of rails renewed on this road out of an average total of about 240,000 tons in track, which gives an average yearly renewal of 3¾ per cent., at which rate the whole track would be renewed once in 28⅔ years. The actual average life of the rails in track will probably be more nearly half that time (though this is yet very uncertain). The fact is that comparatively a very small part of the steel rails laid in this country have needed renewal as yet, but for some roads the time is near at hand when these rails are near the end of their service, and for a time these roads, which long have had to make good less than the average wear will have to renew more than the average. The roads which were long in changing iron for steel will make these renewals more gradually, but even those which make the change most quickly will have their renewals extended over some years, as the rate of wear differs greatly on different parts of the same road.

Nevertheless the addition to the expenses on this account is not likely to be a very serious matter, especially when rails are as low as they are now. It must be remembered that the New York Central charges the whole of the cost of the new rails to expenses, and credits the receipts for old rails to earnings. The latter will pay more than half the cost of new rails. Rails, indeed, have become a comparatively unimportant item in the expenses of a completed railroad.

The total cost of maintaining the road and real estate of the New York Central (including taxes on real estate) for eight successive years has been:

Year.		Year.	
1875–76	$2,266,695	1879–80	$3,134,486
1876–77	2,456,115	1880–81	4,724,485
1877–78	2,872,855	1881–82	4,079,585
1878–79	2,845,740	1882–83	4,652,936

Thus next to 1881, these expenses were greatest last year, and we may take this as an indication that the road has been thoroughly maintained, as it needs to be if it is to carry its traffic at a profit in the face of the increased competition, which is likely still further to decrease its through traffic and for the first time make a considerable diversion of its local traffic.

In the item of maintenance of rolling stock, the large increase last year still left the total a trifle less than in 1881, maintenance of locomotives being 14 per cent. less and maintenance of cars 3½ per cent. more. The total of this item for five successive years has been:

1878–79.	1879–80.	1880–81.	1881–82.	1882–83.
$2,763,716	$3,611,825	$4,273,624	$3,666,764	$4,219,014

In explanation of the large increase of late years it should be remembered that while the increase in road has been trifling, the increase in rolling stock, and especially in cars, has been large. More than 90 per cent. of the above amounts are for maintenance of locomotives, the remainder being for maintenance of tools and machinery in shops and other shop expenses, which latter are, except to the small extent that the shops are used for adding to the rolling stock, really a part of the cost of maintaining rolling stock.

Below we give the total expenditure for maintaining locomotives and cars and *the expense per locomotive and car*, the latter being the best criterion of the extent of the maintenance, indicating whether it has been above or below the average:

	Cost of maintenance of—			
	Locomotives		Cars	
	Total.	Per engine.	Total.	Per car.
1878–79	$879,104	$1,505	$1,665,115	$99
1879–80	969,224	1,528	2,392,700	129
1880–81	1,343,754	2,090	2,652,869	123
1881–82	1,066,621	1,667	2,279,434	94¼
1882–83	1,153,880	1,794	2,737,778	107

The average expense of maintaining a locomotive during these five years has been $1,717, and so the expense was above the average last year. The average cost of maintaining a car (of all kinds) has been $110, and so was a trifle below the average last year. Here we must remember again that old materials sold are not credited to maintenance; but allowing for this the cost per car is larger than on most other roads whose car maintenance we have examined. Most railroads have added very largely to their stock of freight cars within the last five years, and the needful renewals of these have been below the average because the cars were so new. So far as they have been below the average heretofore they must be above the average hereafter, though they may not begin to increase much immediately.

Among the many items of transportation expenses the only ones showing a considerable increase in 1883 over 1882 are wages of agents and clerks (11 per cent.), and damages to persons (90 per cent.); but there was some increase in payments to all classes of employés except general officers, the aggregate increase in these payments being $293,761, one-half of which was to "agents and clerks." There was a decrease in most other expenses, the largest being $157,034 (20 per cent.) in "lighterage and cartage," and $49,243 (2 per cent.) for fuel.

Of the whole expenses of the road 40¼ per cent. was paid directly as wages and salaries, amounting to $8,401,208, to 15,355 different persons, averaging $551½ each, against an average of $527 in 1882. The number of employés last year was at the rate of 15.35 per mile of road, 6 per mile of track and 24 per locomotive, and the work done was at the rate of 27,970 passengers and 148,330 tons of freight carried one mile per employé. That is, through the instrumentality of the railroad and its appliances each employé last year effected what is equivalent to conveying 63 passengers, and 323 tons of freight from New York to Buffalo.

Notwithstanding the fact that the through freight traffic of this road fell off 14 per cent. last year and its stock of freight cars was increased 4 per cent., it received less and paid out more than in 1882 for the use of freight cars interchanged, and the excess of its payments over its receipts on this account increased from $399,647 to $510,131. If only this difference were charged to expenses, as is done by other companies do, it would reduce both gross earnings and working expenses as reported by about a million dollars, and would decrease the expense per ton per mile from the 0.69 cent reported to 0.644 cent. If further the receipts from old materials were deducted from both sides, it would, with the above, reduce the working expenses $1,618,258, and if the reduction on account of materials were charged between freight and passenger business in proportion to the earnings of each, the expense per ton per mile would be reduced further to 0.624 cent per ton per mile, and the latter is the proper figure to use in comparing with other railroads.

RAIL AND CANAL GRAIN RECEIPTS AT NEW YORK.

The grain receipts at New York last year were about 10 million bushels greater than in 1882, but with that exception they were the smallest since 1877, being 15½ millions (11 per cent.) less than in 1881, 44½ millions (26 per cent.) less than in 1880, 38½ millions (28½ per cent.) less than in 1879, and 28 millions (18 per cent.) less than in 1878. The total New York receipts, including grain of all kinds and flour reduced to bushels, for 14 successive years have been, by rail and water:

New York Grain Receipts by Rail and Water for 14 Years.

	By rail.	By canal.	Coastwise.	Total.
1870	32,200,000	34,600,000	3,100,000	69,921,175
1871	34,500,000	52,500,000	2,600,000	89,543,673
1872	38,000,000	50,400,000	2,500,000	90,830,336
1873	48,000,000	42,800,000	1,300,000	92,137,971
1874	57,600,000	47,300,000	2,400,000	107,273,158
1875	54,000,000	37,800,000	2,000,000	93,695,082
1876	59,047,951	32,735,773	4,165,526	95,949,252
1877	50,892,967	48,336,176	4,004,639	103,313,782
1878	85,350,079	63,905,872	3,663,219	152,687,170
1879	101,929,243	57,044,416	4,151,241	163,124,890
1880	93,414,823	69,440,901	4,231,820	169,042,362
1881	98,574,248	38,192,730	3,131,210	139,898,188
1882	79,773,026	32,150,406	2,481,048	114,405,380
1883	79,390,091	41,220,908	3,725,238	124,336,237

While the total receipts in 1883 were ten millions more than in 1882 the rail receipts were nearly the same, but a trifle smaller, and smaller than in any

previous year since 1877. On the other hand, the canal receipts were nine millions more than in 1882, and three millions more than in 1881; but with these exceptions the smallest since 1876, and smaller than in any of the four years from 1871 to 1874, inclusive.

In two of these years, 1876 and 1881, railroad wars, extending over nearly the whole season of navigation, diverted large quantities of grain from the canals. In 1876 the railroads brought 61½ per cent. and in 1881 70 per cent. of all the grain received at New York. Last year the abolition of tolls on the canals enabled the boatmen to compete better with the railroads than in many previous years. Yet the canals carried but 33.1 per cent. of the New York receipts last year, which is less than in any year previous to 1881. The percentages by rail and canal for the fourteen years have been:

Year.	Per cent. by Rail.	Per cent. by Canal.	Year.	Per cent. by Rail.	Per cent. by Canal.
1870	46.1	49.5	1877	49.3	46.8
1871	38.5	58.6	1878	56.0	41.9
1872	41.8	55.5	1879	62.5	35.0
1873	51.0	47.6	1880	56.4	41.1
1874	53.7	44.0	1881	70.4	27.2
1875	57.6	40.3	1882	69.7	30.3
1876	61.5	34.4	1883	63.9	33.1

This is a significant showing. It indicates that the relative importance of the canal as a carrier has fallen permanently when the total abolition of tolls fails to give the boats more than one-third of the year's shipments. That they should have got but 27 per cent. of them in 1881, when the railroads were carrying grain for 12½ and 10 cents per 100 lbs. from Chicago to New York, was not surprising; that when the roads maintained rates as well as they did in 1882, they should have got no more was not encouraging for the canal trade; that was the first year that the railroads had had a regular summer rate as low as 25 cents, and it seemed that the boats were unable to compete with this and pay tolls. But now the abolition of tolls fails to give them anything like their old proportion, and it is not easy to see what more can be done for them.

It may be said, however, that the canal carried a very large proportion of the receipts during that part of the year that it was open, and that nothing more is possible for it, and that the reason why the railroads carried so much is because an unusually large proportion of the receipts came while navigation was closed. This is true; it has been true for three years past. During the five months that there were substantially no canal receipts in 1883 48½ of the whole 124½ millions of receipts arrived. In the other months the canal carried nearly 55 per cent. of the whole. In 1882 the canal carried but 38½ per cent., and in 1881 but 37 per cent. of the total receipts during the season of navigation. Even in 1880, before the percentage of the year's receipts by rail became so large, the canal brought but 44 per cent., in 1879 51 per cent., and in 1878 42 per cent. of the receipts during the season of navigation.

This is very well, as far as it goes. Of the whole amount of grain received at New York during the season of navigation the canal certainly did deliver an unusual proportion in 1883, when first relieved from the payment of tolls.

But this only shifts the ground of the inquiry. It remains true that the canal delivered an unusually small part of the grain receipts of 1883—what would have been unusually small in any year previous to 1881. It is because the railroads carry more in winter, we find; but why do the railroads carry so much in winter? So far as the boatmen and the railroads and the port of New York are concerned it makes little difference whether the railroads carry the grain in January or July. If they carry it the canal cannot: and they have, as we have said, of late years carried exceptionally large quantities in winter. The total New York receipts during the five months from December to April inclusive, and their percentage of the year's receipts for six years (a little by coastwise vessels, but nearly all by rail) have been:

Year.	Bushels.	P. c. of year.	Year.	Bushels.	P. c of year.
1876	25,147,730	26.3	1880	40,146,521	23.7
1877	23,353,803	28.6	1881	26,591,772	19.0
1878	41,580,474	27.2	1882	32,513,252	28.4
1879	48,815,350	30.0	1883	38,887,902	31.3

That the winter receipts were larger in 1878 and 1879 than in the last two years should not deceive us, for the total receipts were then much larger, and that the percentages were large in these earlier years was due to the fact that there were very low rates made by cutting in both these winters, except in the Decembers. The significant fact is that the *regular rates* of the past two winters have brought forward an exceptionally large proportion of the year's grain receipts, and did last year, when t was known that the grain would be carried by a free canal if held till spring.

It was during these last two winters only that the railroads have made a *regular* rate as low as 30 cents and maintained it reasonably well. Now the canal has to compete with the railroads in winter as well as summer. Nothing is more certain than that a great deal more grain will go forward in winter, if there is an export demand for it, when the rate is low than when it is high. For two years past the winter shipments have been so large that there was comparatively little left to ship after the canal opened until the new crop began to go forward. Apparently the rates of the last two winters have been so low that the shippers could not be tempted even by a free canal to hold back their grain till the opening of navigation.

Much, of course, depends on the crops and the foreign demand. With a small surplus and a sharp demand the grain might be taken mostly before navigation closed in the fall, leaving nothing to make a heavy winter movement. With a very light foreign demand there may be a light movement to the seaboard even when there is plenty of grain, as has been the case this year. Generally, however, it seems that at a rate of 30 cents per 100 lbs. from Chicago, or less, a very large proportion of the grain will come forward while navigation is closed. Everything that stimulates the winter rail movement, we should bear in mind, increases the receipts of all other Atlantic exporting cities except Montreal, and a reduction in rates which brings New York an addition of 10 millions to its winter receipts may add 20 millions to those of Boston, Philadelphia, Baltimore and New Orleans, and so reduce by 30 millions the quantity for which the canal will be able to compete when navigation opens. Without any question it would be better for the New York grain trade if the railroads should make their winter rate 40 or 50 cents, as formerly, unless, indeed, such a rate should force shipments down the Mississippi during the winter more than it should cause to wait for the opening of the canal. So far, however, as we have shown heretofore, the river has had no appreciable effect. It is since it was improved that the proportion of winter shipments to New York has become greatest.

Neglect to Report Violation of Rules.

The injunction to report the failings of his "fellow-servants," which nearly every railroad employé receives from his superintendent, is doubtless one of the most conspicuous of that class of rules which are "more honored in the breach than in the observance," and it would probably be a profitable study, if it were a practicable one, to analyze the various motives which actuate so large a class of men to such unity of behavior. Very likely most observers would call it wholly self-interest, that being a convenient explanation for almost any human action that is not otherwise readily explainable, but we are not at all certain that this covers the whole question. The opposite is sometimes the case; men who are both intelligent and trustworthy preferring to risk the censure of superiors rather than show (as it appears to them) a lack of friendship for a friend, possibly a relative, who has committed some blunder which the rule requires to be reported to headquarter by all who know of it. This motive is doubtless often mixed with that other which counsels silence concerning *everything*, on the principle that one is quite likely to criminate himself, whatever he says; though the latter is commonly enough seen wholly by itself, as most superintendents can testify, where employés who would be glad enough to injure others are kept silent by no other influence than this idea of real or supposed self-protection. Doubtless the phraseology of the rule sometimes affords a slight relief to the consciences of certain classes, where it refers only to "officers of the company," "heads of departments," or "persons in places of trust;" numbers of minor officials who are, in fact, depended upon by the manager to keep him informed about what is going on, excuse themselves from an unpleasant duty by the forced assumption that their position is not within the meaning of the rule.

Notwithstanding the difficulty of enforcing this order, it cannot be regarded as a useless one, and there ought to be some practicable way of deriving benefit from it. Perhaps some division superintendents, when they discover cases of misconduct which have plainly been "hushed up" by men who hope thus to aid each other, could do a good work by administering a small dose of punishment to those who are found to belong to the "mum" clique. There could be no reasonable complaint against such action on the ground of injustice, for the well-known principle of law, that "it is a fraud to conceal a fraud," applies perfectly; though of course the offenses we are considering must, if classed as frauds, generally be regarded as mild ones, and so as calling for lenient application of the principle. Although the division superintendent or his equivalent—the officer who deals directly with the operating employés—must cure this evil—if it is cured at all—by his own efforts, he may perhaps improve matters indirectly by showing the men the true reasons for the existence of some of the rules which they see broken but which they at the same time try to think are not of enough importance to necessitate the investigation of every infraction. When a lazy or heedless brakeman carries out a rear signal only half as far as the rule requires, some of the men who witness his behavior excuse themselves from reporting, perhaps on the ground that, *in their opinion*, safety has been secured, and that, they say, is all that is required. Such men ought to be given a fuller understanding of what the management requires of them; they ought to know that the maintenance of discipline requires very often that an experienced and proficent operative does much more than seems to him necessary, for the sake of its influence on those who are less careful, and to provide against others' heedlessness. They should know that many things are required for the express purpose of making safety *doubly certain in every instance*. A man may feel absolutely sure that he is exhibiting a red flag in the best position for the approaching engineman to see it, and deem it useless to use torpedoes, "especially," he will say to himself, "as 'Joe' (or Tom, or Dick) is running to-day, I am safe enough he will not fail me; if it were a new runner I would be more cautious, but under the present circumstances the rule is too strict;" or when, in switching, the main track is to be obstructed for only a minute or two, or for but a few rods beyond the station limit, vigilance will be relaxed because there is such a very small apparent chance of any harm ensuing, no thought being taken of the possibility of running off the track or other accident occurring at the most critical moment, or of unforeseen circumstances happening to prevent an approaching wild train being heard or seen. These and numerous other possible cases of a similar nature ought to be the text of frequent and extended lectures, sermons, "talks," circulars, or some kind of communication from the active managing officer to his trainmen. The latter ought to have the benefit of the more extended range of observation that is enjoyed by their superiors, and to know that every danger signal ought to be shown where it will be observed by a new runner as readily as by an old one, and where the careless as well as the vigilant ones will have their attention seasonably arrested by it; that accidents to engines or cars are liable to occur at *any* moment, even when every human provision has been made against them, and that this liability makes it necessary to guard against the approach of trains at times which, a single minute beforehand, could not be foreseen.

The examples here cited are suggestions merely; those of similar importance and involving the same principles will suggest themselves numerously to any one conversant with railroad working and the lessons it teaches. Our aim here is simply to set forth the *principle* underlying all these cases of slackness and half-hearted obedience to reasonable requirements, which is, that ignorance is largely the cause of this lack of foresight and cautiousness, whether it be found in railroad employés or elsewhere. When men fully realize the importance of a rule they will be more conscientious in aiding the management to enforce it.

The veterans in railroad service have acquired a good degree of enlightenment by experience; but if railroad companies are to continue employing such an increasing share of inexperienced operatives in positions of responsibility as the present tendency seems to indicate, there ought to be some way devised of infusing a little artificial experience, so to speak, into those who have not had the opportunity to acquire it in the old-fashioned way. This may appear to be an impossible task, but it is certainly worth attempting.

Mr. Robert Harris, who was made President of the Northern Pacific Railroad Company last week, is, professionally, purely a railroad man—that is, his training for executive duties was not in a bank, in mercantile business, or in a law office, but on railroads, as an engineer, assistant superintendent, general superintendent and president. In his youth he served in the navy, and he was also an army officer for a time during the war. His railroad service before coming to the Erie was almost entirely in the West, for a little in Texas, longer on the Western Union Railroad from Racine southwest, and then for many years on the Chicago, Burlington & Quincy, where he first became widely known, and where he rose by successive steps from an assistant superintendency to be President, but for most of the time was Superintendent, exercising authority over all departments except the financial, having charge of the traffic as well as the transportation departments of the road, and therefore necessarily responsible for the general

policy of the company in relation to its patrons and to its competitors and connections. He had the great advantage of growing up under and succeeding an unusually skillful and successful management, and therefore it would be an exaggeration to say that the success and prosperity of the company, and the exceptionally great satisfaction which it gave to its patrons and to the other railroad companies with which it had to deal as partner or competitor, was due wholly to him. But the property was vastly extended during his term of office as Superintendent and President, and its reputation was maintained and increased, and not a little of this reputation, it is safe to say, was due to the skill, breadth of view, and high sense of justice and honor of Mr. Harris' administration. No customer of a railroad has a stronger sense of the duties of the railroad to the community than Mr. Harris, and in relations with other railroads he has always been quick to see and ready to acknowledge their just claims, which has helped greatly in maintaining friendly relations, the judicial quality of his mind and his natural love of justice leading all to give great weight to his opinions. These qualities of Mr. Harris are less well-known in the East than in the West, because on the Erie he did not have charge of the traffic department, and consequently had not the difficult and delicate negotiations to conduct which pertain to that department and make the negotiator widely-known among other railroad men.

Mr. Harris' service on the Chicago, Burlington & Quincy gives him some special qualifications for his new post. The Burlington has always had a large mileage of road in new country, and its success, like that of other roads west of Chicago, has depended largely on its skill in developing the traffic of this new country. What that skill has been may be judged from the tremendous growth of that new country, which has enabled the company, under the administration of Mr. Harris and his successor, to make magnificent returns from a constantly increasing system and investment. On the financial side, which, perhaps, seems now to be the difficult side, of the Northern Pacific, Mr. Harris brings the strength which comes from absolute honesty and transparent frankness. The stockholders under his administration may expect to know the facts which affect the value of their property, whether favorable or unfavorable, and may absolutely certain that it will not be managed for the promotion of anybody's stock speculations.

Since the new standard of time has been adopted the credit for it has been claimed for several persons, and there seem really to have been three or four different persons who independently conceived the idea of making the time standard substantially the same as that which has been adopted. But quite recently a great many articles have appeared in different newspapers claiming particularly the credit for the new standard for Prof. Charles F. Dowd, of Saratoga, and describing minutely what he did with relation thereto. The history of his efforts is, we believe, truthful. Professor Dowd, as long ago as 1869, proposed the adoption of a uniform railroad time, and he modified his plan so that eventually it became almost identical with that which Mr. Allen proposed a year ago and is now adopted. He published a pamphlet giving the differences between Washington time and the local time of some 8,000 stations, with the idea then that local time would be preserved. He submitted his ideas to railroad men and railroad organizations with great zeal. Yet it does not now appear that Professor Dowd's labors had the slightest effect. There never was any opposition worth mentioning to the adoption of a uniform time standard, and there was, as we have said, more than one person who developed the present system independently. When the question came up last year scarcely any one knew what Professor Dowd's plan was, in spite of all his labors. In this office, where perhaps as much pains are taken as anywhere to preserve information of the kind, we knew only that he had proposed *some* plan for a uniform standard. Mr. Allen, who wrought out in detail the plan adopted, was, we believe, entirely ignorant of Mr. Dowd's plan until his own was completed. Nevertheless, so far as the conception of four standards one hour apart is concerned, credit for priority doubtless belongs to Professor Dowd, though those who came after him conceived the same thing independently. But this conception did not give us standard time, and never would have given it. It was the working out a method for the practical application of the system, making the changes come at the termini of railroad divisions, doing beforehand the work of adjustment which otherwise would have had to be done by hundreds of railroad officers all over the country, and so would not have done at all simultaneously, as was necessary, and presenting a plan completely ready for adoption, that gave us standard time, and this was done by Mr. W. F. Allen; and his knowledge of the necessity of this preliminary work, and the skill and completeness with which he did it, enabled him to secure the adoption of a uniform standard with probably hardly a tithe of the effort which was made by Professor Dowd without any result whatever, unless it were accustoming some people to the idea of a time standard. His idea, his zeal and his industry deserve all credit, but his effort was not directed so as to attain the purpose aimed at, and even if his plan had been consciously adopted by Mr. Allen the credit for its adoption would still belong to the latter.

The lines from Boston to the West have agreed to pool their business, which has been in a demoralized condition for some time. There was a pool at one time, but it has not been in operation for a long time, the new lines to Boston made in connection with the Erie and the Pennsylvania apparently finding it necessary to cut the regular rates in order to secure traffic in the face of the differential allowed to the Central Vermont-Grand Trunk route. At all events the new lines have been taking a very considerable amount of business, and have done it at the expense of the Central Vermont rather than the New York Central, though the latter's share of the business has been very considerably reduced since these roads came in. The Erie, working over two Boston connections, the Hoosac Tunnel and the New York & New England, has recently taken more than twice as much of the New England business (of that carried at Boston rates) as the Central Vermont, and the Pennsylvania has also carried more than the latter, and with its differential rate and the general demoralization the share the Central Vermont has been getting cannot have been worth much. This traffic is of considerable importance, as Boston is, next to New York, the chief importing city, and the other towns that take Boston rates are the shipping points for great domestic manufactures, mostly of high-class goods. Their shipments recently have been equal to about two-fifths of the New York shipments, and there are as many competitors for them as there are for the New York business, all the trunk lines but the Lackawanna getting a share of the business (the Baltimore & Ohio only a trifle, however), and the lower open rate charged by the Grand Trunk making it rather more difficult than elsewhere even to maintain rates. As things were going, however, the large business was fast becoming unprofitable, which was bad enough, but not so bad for the New York trunk lines as the effect the demoralization in Boston was sure to have on the larger New York business. Rates cannot be much lower from Boston than from New York to the West without New York merchants and New York railroads feeling it. Certainly the New York merchants will be unanimously in favor of the strict maintenance of rates—at Boston.

The Pennsylvania Railroad follows the fashion and reports a decrease (7.6 per cent.) in December earnings on its lines east of Pittsburgh and Erie, while its lines west of those places failed to earn enough in the month to cover all liabilities for rental, interest, etc., by $310,248 in 1883, against a deficit of only $6,984 in 1882. But the expenses of the lines east of Pittsburgh and Erie decreased nearly as much as the earnings, leaving their decrease in net earnings only $1,625, which is but one-seventh of 1 per cent. And the reduction of expenses is not an unreasonable one, for the December expenses in 1882 were extraordinarily large—more than $200,000 larger than any month's expenses had been theretofore and $418,000 above the average monthly expenses of that year. Last December's expenses are a very little above the average for 1883. But the considerable decrease in gross earnings of 7½ per cent. is noticeable because heretofore it has seemed that nothing could arrest the growth of this road's earnings. The leading industries of the country on this road have been in a more or less unsatisfactory condition for several months, and indeed for the whole of 1883, but till December there was a decrease in earnings in but a single month (July), and that was trifling ($18,200), and made in comparison with extraordinary earnings the year before; and for the whole year the road shows an increase of $2,003,418, or more than 4 per cent., in gross earnings, and of $903,673, or nearly 5 per cent., in net earnings, against which must be put a decrease of $1,090,452 in the surplus over liabilities of the system west of Pittsburgh, so that the profit to the Pennsylvania Railroad Company from the two systems was $20,139,950 in 1883 against $20,326,729 in 1882—a decrease of only $180,779, which is about ¾ per cent.

The question is whether the decrease in earnings shown in December will continue. So long as the iron and other leading industries of Pennsylvania are in their present condition, it seems inevitable that there should be a decrease in this railroad's earnings; but its progress last year in the face of unfavorable circumstances makes it dangerous to prophecy this, and unless there should be a considerable reduction in the rates received, it is quite possible that there may be a decrease of expenses equal to or exceeding any decrease in earnings.

The trouble between the Lackawanna and the other New York trunk lines was settled before our last issue appeared by an agreement to arbitrate, as it should have been settled in the beginning. The reference is not to the arbitration regularly provided, but the Lackawanna appoints one arbitrator, the trunk lines another, and these two are to agree upon a third. Meanwhile rates are restored and traffic relations are the same as if the matter were settled. The difficulty with this kind of arbitration is that either party, if so disposed, can prevent its execution by choosing an arbitrator who will not consent to any third arbitrator who will be acceptable to the other. One of the best features of the Trunk Line Commission and the Joint Executive Committee is that they provide for an immediate temporary division of the traffic, to be made by the Commissioner, and compel a final arbitration within a limited time, by giving the Commissioner power to select arbitrators if the railroads fail to do so in time. The ability to prevent any settlement, and so maintain the *statu quo*, is one of the great obstacles in the way of bringing the negotiations of railroad companies to a conclusion.

The injunction procured by the Lackawana to restrain the roads west of Buffalo from refusing its traffic was not tested because a settlement was arrived at amicably, but its terms, we should say, were substantially the terms stated in the notice of the Buffalo roads to the Lackawanna roads. Judge Haight restrained the Buffalo roads "from imposing any conditions or exacting any orders or regulations touching the terms or manner of delivery to it, or the receipt by it, of freight from the plaintiff *other than such as are imposed and enforced by the defendant respecting freight received by it from or delivered to it by the New York Central & Hudson River Railroad Company.*" This is all that the Joint Executive Committee roads contended for. They demand of the New York Central and of all other roads certain terms as a condition of their acting as forwarding agents, and accepting a certain proportion of the through rate. They offer to exchange business with all other roads on the same terms. If the case had come to trial it would, we believe, have been decided that the Buffalo roads could *not* be compelled to accept freight from the Lackawanna on terms different from those imposed on the other roads.

The difficulties of the Joint Executive Committee with the Chicago-Missouri River roads, or rather with the Chicago & Alton and the Rock Island roads, have been settled by the Committee's accepting what is substantially the last proposition of these roads—to limit the *amount* of the commission to $3 for first-class and $2.50 for second-class tickets, and to agree that these tickets shall not be sold to persons who will divide the commission with the passenger. These two companies expressly refuse to be restricted otherwise as to the persons to whom they shall pay commissions, and are therefore able to sell through agents not in the employ of any railroad company. The agreement not to sell through persons who will cut the rate will hardly amount to anything, for outside agents cannot be controlled, and they can rarely do any business unless they do cut the rates. Perhaps, however, by the position they have taken, these two roads have secured the favor of these outside men for the time, so that so far as they are able to influence travel they will turn it over these roads.

The New York through shipments to the West by the trunk lines were larger last December than they have ever been before except in 1881, when the rates were about half as great as the present regular rates. But last month the Lackawanna was carrying everything nearly at a fifth less than the regular rates, and other companies were "protecting their customers" to a greater or less extent. For the entire year the shipments in 1883, though considerably less than in 1882, must have been nearly the same as in 1881, and much greater than in any previous year. In 1882 the heavy business was made by the contracts at less than half regular rates, which lasted through the first half

of the year, during which time the shipments were nearly one half greater than in the last half of the year, when rates were restored and maintained. In 1883 the shipments were larger in the last half than in the first half of the year, and at least as great as in the last half of 1882. This is important as indicating the condition of business, but the fact that rates were not so well maintained in the last half of last year may have made a considerable difference in the amount of the shipments by the trunk lines.

The St. Gothard Tunnel.

This tunnel under the centre of the main mountain chain of Europe has now been open long enough to enable some interesting observations to be made regarding its ventilation and temperature under traffic. As the tunnel is the longest in the world, being not less than 9¼ miles long, has no vertical shafts, and for the greater part of its length is situated at a depth of from 4,000 ft. to 5,500 ft. beneath the surface, it was feared that permanent artificial ventilation would be required, especially as the temperature during construction, notwithstanding copious ventilation, rose to 88° Fahr. before the headings met. The temperature of the air in the tunnel has since steadily fallen, and now stands at 69° Fahr., while the amount of moisture in the atmosphere has also considerably diminished, there being now only 81 per cent. of saturation in the centre of the tunnel, instead of 98 to 100 per cent. during construction. The average temperature of the rock in the whole tunnel has fallen from 74° to 57° Fahr. It is estimated that the heat and foulness of the air in the headings diminished the work of which the 2,000 men and 70 horses were capable by one-half. The top heading system of driving was adopted in order to complete an opening throughout for ventilation as soon as possible. Unfortunately, this method prevents the possibility of introducing special pipes conveying compressed air to the front of the heading for the purposes of ventilation. The air for working the rock drills was compressed to a pressure of 90 lbs. to the square inch, and the exhaust was used to ventilate the tunnel, but proved insufficient in quantity. Profiting by this experience, the workings of the Arlberg Tunnel (which has since been bored under the Tyrolese Alps) were ventilated by air compressed only to a pressure of 3 lbs. above the atmosphere and conveyed in pipes varying from 20 to 12 in. in diameter.

The St. Gothard Railroad extends from Lucerne, in Switzerland, to Chiasso, on the Italian side of the Alps, and includes, with branches, 165 miles of line, on which are 51 tunnels, of a total length of 15 miles, exclusive of the great tunnel. It is found that the tunnels owe their ventilation to four different and partial causes—the wind, the difference in barometric pressure at the two ends of the tunnel, the difference in temperature, and the passage of the trains, which draw fresh air in behind them and drive the foul air out in front of them. This last cause is found almost sufficient to ventilate the tunnels on level gradients. In long tunnels the air is purer where the gradients are comparatively level, as in ascending the steep gradients the locomotives emit more steam and smoke, which is not carried off by the stronger current of air due to the greater difference in level between the two ends of the tunnel. The air is purest in a cold tunnel, as the comparatively warm smoke and steam keep near the roof clear of the train. The main tunnel is inclined from either end to the centre, which is the highest point, the steepest gradient being 26 ft. to the mile.

The heaviest grade on the approaches to the tunnel is 143 ft. per mile, and the sharpest curve is of 984 ft. radius, or nearly 6°. The main tunnel is laid with two lines of rails, the approaches being single track. The permanent way throughout the line consists of steel rails, each 26 ft. long, weighing 72 lbs. per yard, fastened by spikes to ties measuring 8 ft. by 9½ in. by 6 in. Fir and pine ties are used on the heavier grades, placed 2 ft. 8 in. apart, centre to centre. On the "Valley section," where the ruling gradient is 53 ft. to the mile, lighter engines are used, and the ties are of oak and larch placed 3 ft. apart. On the north side of the tunnel the ties are pickled with chloride of zinc, and on the south side sublimate of mercury is used as a preservative. The ballast has a thickness of from 14 to 16 in., increased in cuttings to 19 in. The cost of the approaches, including numerous tunnels and several short bridges of about 200 ft. span, was $135,000 per mile. These tunnels, eight of which average a mile long, cost $75.50 per foot forward or $400,000 per mile, while the main tunnel cost $233 per foot, or $1,250,000 per mile. The cost of blasting was $7 per cubic yard, and the cost of walling about $9 per cubic yard. The locomotives employed by the contractors in the main tunnel to haul out the spoil were worked by compressed air, cylinders, valve motion, etc., of the ordinary type being employed.

At present five passenger trains and eight freight trains pass through the tunnel each way daily. The latter are worked over the heavy grades by powerful eight-connected locomotives, the leading dimensions of which were referred to in another article. The passenger cars are mostly four-wheeled, but are otherwise of the American type, with end platforms, on which passengers may stand to enjoy the magnificent mountain scenery. The cars are all lit by gas and warmed by hot air. The express trains are fitted with continuous non-automatic brakes on the Hardy system. Electrical contact apparatus are provided along the line, which record the speed of the trains. The stations are provided with home, distant and starting signals, interlocked with the switches.

An illustrated account of the tunnel, giving particulars as to the route followed, and describing the well-known spiral tunnels, will be found in our issue for Sept. 10, 1880.

The grain movement *from the West to the East* has been extraordinarily light recently, though it was somewhat stimulated for a time by the open 20 cent rate which lasted from Jan. 5 to 13, inclusive, and covered probably most of the shipments that went forward the following week. But it is a mistake to call the total grain movement light. The receipts of the Northwestern markets have rarely been exceeded, and even the shipments of these markets have been large, though not large enough to prevent a great accumulation of wheat (not of other grain) at Chicago and other Western elevators. But the receipts at the Atlantic ports and the exports from them have been small indeed, and this leads some Eastern observers to suppose that there has been a very light total movement, and that an exceptionally large proportion of the grain produced remains in farmers' hands. Actually, as we have shown several times since harvest, the receipts of the Northwestern markets have been decidedly large this year, and they are not now small. But the receipts at the Atlantic ports have been small truly, and for the week ending Jan. 12 last were smaller than in any other week since 1875, though there were not so great natural obstacles to prevent receipts as the snow blockades and floods that have sometimes reduced them in previous winters. And the exports are also the smallest for several years, except at times during the crop year after the harvest of 1881, when the total production of grain was about 500 *millions* of bushels (20 per cent.) less than in 1883. The report of the total United States grain exports does not fully reflect the smallness of the business on this coast, because the exports of the Pacific ports are large this year. With these included the exports of flour, wheat and corn last December were but 11,964,598 bushels against 15,122,470 in 1883, and 12,539,566 bushels in the exceptionally unfavorable year 1881. But we get no adequate idea of the falling off in the grain exports if we go no further back than 1881, and we therefore give below the December exports of flour, wheat and corn, in bushels for the past eight years :

Year.	Bushels.	Year.	Bushels.
1876	9,030,973	1880	20,899,575
1877	12,515,397	1881	12,539,566
1878	16,635,215	1882	15,122,470
1879	18,234,616	1883	11,964,598

Thus we have to go back to 1876 to find a December, when our grain exports were as small as last December and the decrease compared with the years 1878, 1879 and 1880 is very large.

Now all the appliances connected with the export of grain—the number and capacity of the carriers, the provisions for transferring and storing, and the number of persons engaged in the trade—have been prepared to do a larger and not a smaller business. The great and rapid increase from 1877 to 1880 led people to expect and prepare for a further increase, so that even if the exports had remained stationary there would have been disappointment, and as there is a decrease of 40 per cent. since 1880 there is, of course, great disappointment and much idle machinery.

And as this decrease in exports has been almost wholly at the Atlantic ports, it is felt here still more than if it had extended to the Pacific also. The exports of San Francisco and Portland were more than 3,100,000 bushels last December, which is much more than in any December previous to 1881, but much less than in 1881, when they were more than 5,000,000 bushels. They were nearly the same in 1882 as in 1883, so that the Atlantic exports last December were 8,860,000 bushels, against 11,820,000 in 1882, and while the total decrease in exports from the United States was 21 per cent., the decrease in Atlantic exports was no less than 25 per cent.

The provision exports no longer show the great increase over 1882 which we have remarked from July to November, at least the exports of hog products, which are by far the most important, showed no increase in December. For five successive years the December exports of hog products (bacon, ham, pork and lard) have been, in pounds :

1879.	1880.	1881.	1882.	1883.
113,368,618	154,530,775	104,026,767	90,128,747	87,394,071

Thus the exports last December were less than in the corresponding month in any of the other years, though only 3 per cent. less than in 1882.

For the calendar year the exports of hog products for six successive years have been, in pounds :

Year.	Pounds.	Year.	Pounds.
1878	1,138,109,904	1881	1,012,566,708
1879	1,186,685,121	1882	644,428,736
1880	1,332,998,682	1883	708,669,537

Thus for the whole year there is an increase of 19 per cent. in these exports, leaving them, however, about one-fourth less than in 1881, and 42 per cent. less than in 1880, when they were larger than ever before, and much less than in the two years previous.

This is the export which of all that we make should, it would seem, find a demand scarcely to be limited by any possible production of ours. It affords cheap meat to a continent of laborers who, for the most part, get very much less than they want. Our largest exports were only at the rate of about 4 lbs. per inhabitant of Europe, and we make considerable exports to non-European countries. An addition of 2 oz. per week to the consumption of each European would require one and a half times our largest yearly exports, so we may count on a tremendous increase in the demand whenever the working people in Europe are able to take one or two more meals of meat weekly. But this they will do only if more than usually prosperous; and when work is bad they greatly reduce their consumption of meat, and live more upon bread, which makes the demand for provisions much more fluctuating than that for grain and flour. Europe was prosperous in 1882, however, when our exports were smallest, and they were small then because the bad corn crop of 1881 had made the supply short, and we were consuming at an unprecedented rate ourselves.

The exports of cattle products show a notable gain in December, as they did generally in 1883, amounting for the month to 30,857,077 lbs., against 21,007,398 lbs. in 1882 and 20,435,465 lbs. in 1881. And for the two years the exports have been :

	1883.	1882.	Increase.	P. c.
Pounds	352,094,614	245,261,659	106,832,955	43.5
Value	$35,728,753	$25,351,872	$10,376,871	40.9

This enormous gain is very encouraging. The gain is very great in everything except cheese and tallow, and there is some gain in these; but more than half the gain is in fresh beef, which shows an increase of 63 million pounds and $6,373,000. The increase in the value of hog product is but about 10 per cent., though the increase in quantity is 19 per cent., but altogether there is an increase in all provisions of 26 per cent. in pounds and 15 per cent. in value over the very bad exports of 1882. The total value, however, is $19,000,000 (14 per cent.) less than in 1881.

There are two establishments in Chicago either of which packs more hogs than are packed altogether in any other city in the world—Armour & Co., who packed 1,025,484 in the twelve months ending with February last, and the Anglo-American Packing Co., which packed 759,374. The number packed by Armour & Co. made about 150,000 tons of freight, which as live hogs probably loaded 15,000 cars, or an average of nearly 50 car-loads for every working day of the year; while the shipments of product (very little offal is wasted) would weigh nearly as much as the hogs, though they would require fewer cars, larger average loads being practicable, as pork can be piled up in the cars and live hogs cannot be. It may be imagined that when the railroads are struggling for traffic there is a great temptation to give such a firm a rebate in order to secure its enormous business, and a rebate of no more than 3 cents per 100 lbs. on all its business would amount to $90,000 per year, which it is worth the while even of Armour & Co. to try to secure.

Chicago through shipments eastward for the 9 days of the 20-cent rate ending Jan. 13 (two of which were Sundays), by the complete report were 62,221 tons, or at the rate of 48,394 tons per week, of which 10.7 per cent. went by the Chicago & Grand Trunk, 17.8 by the Michigan Central, 19.5 by the Lake Shore, 7.7 by the Nickel Plate, 16.7 by the Fort Wayne, 15.4 by the Chicago, St. Louis & Pittsburgh, 3.4 by the Baltimore & Ohio, and 8.8 per cent. by the Chicago & Atlantic. The three Vanderbilt roads thus carried 45 per cent. of the whole, and the two Pennsylvania roads 32.1. The only roads very much out of the way were the Chicago, St. Louis & Pittsburgh, taking 15.4 per cent. instead of 8, and the Baltimore & Ohio, with 3.4 instead of 7. The shipments, it should be remembered, included considerable quantities billed before the rates were reduced. The Vanderbilt roads have not carried the proportion of the business to which they were entitled since July last, and will have to be paid in money if they do not carry freight enough hereafter to make good their shortage.

For five successive years the shipments in the second week of January have been :

	1880.	1881.	1882.	1883.	1884.
Tons	31,171	59,587	70,724	66,034	48,394

Thus the shipments this year were less than in the corresponding week of any preceding year since 1880, and were 27 per cent. less than last year.

The Chicago through and local shipments eastward of flour grain and provisions for the week ending Jan. 19, by the incomplete report made to the Chicago Board of Trade, were 66,892 tons, against 52,822 tons reported in the corresponding week of last year, and 42,126 tons in the previous week of this year. The week ending Jan. 12 was the week of the 20-cent rate, and last week was the first week of the restoration of the 30-cent rate, notwithstanding which we see that there was an increase of nearly 60 per cent. last week. The fact doubtless is that the shipments reported for last week were nearly all billed the week before, and part of them forwarded then; for, as we said recently, this statement which purports to cover the shipments of the week ending with Saturday usually includes no shipments made on Saturday and not all of those made on Friday, but in some cases (perhaps most) does include shipments ordered but not yet forwarded. Now when an advance of rates is ordered, as was done in the middle of the week ending Jan. 12, naturally there is a great effort by shippers to bill their freight before the advance goes into effect, and it would be easy in Chicago to bill almost the whole week's shipments on Saturday.

Besides this, the low rate lasted till Monday in all the country west of Chicago, and a large part of the shipments actually started forward from this country week before last were not transferred to the roads east of Chicago until last week.

It will be interesting to know how much freight was forwarded under this 20-cent rate, which was in force only eight days, and which was intended as a fine for not maintaining rates. Sometimes when there is an advance in rates shipments at the old rates continue for an unconscionable

time afterward on certain roads, usually those which were suspected of cutting rates before.

Of the shipments last week 13,939 tons were flour and 41,210 were grain, the two making about four-fifths of the whole. During the previous week the grain shipments reported amounted to but 22,504 tons, so that nearly the whole of the large increase in shipments was grain, which, as enormous stocks are accumulated, can be sent forward in almost any quantity when the shippers so desire. But the fact that nearly twice as great shipments were reported last week, when the rate was 30 cents, as the week before, when the rate was 20 cents, is further and strong evidence that the shipments reported last week were chiefly billed at the rates of the previous week, and that part of the shipments of the previous week were billed before the reduction to 20 cents, which reduction, however, took effect Saturday, Jan. 5, and not on the following Monday.

The chief grain crops of 1883 are estimated by the Department of Agriculture, in its December report, subject to correction hereafter. We give the estimates of the aggregate production of the United States below, together with the reported production for four years previous, the figures being for *millions* of bushels:

Wheat	459.5	498.5	280.3	504.2	420.9
Corn	1,754.9	1,717.4	1,194.9	1,617.0	1,551.1
Oats	407.9	417.9	416.5	488.3	571.2
Total	2,622.3	2,633.8	1,991.7	2,609.5	2,542.3

Thus the aggregate production of these three grains is a little less this year than in any other except 1881. The exceptionally large amount of corn that is of very poor quality not fit to shell at all and worth very much less than sound corn to feed, is equivalent to a reduction of many millions in this crop. A bushel of oats is equivalent to about half a bushel of corn for feeding, but sells for about three fifths as much. By the latter standard the increase of 83 millions in oats makes up for 50 millions of the decrease in corn, leaving but 16 millions decrease in the feeding grains, besides the deficit in quality of corn. The decrease in wheat is thus the only one of great importance.

The Department does not estimate the crops of barley and rye, but says there was a medium yield of barley and not quite an average crop of rye. In 1882 there were 30 millions of rye and 49 millions of barley, and these were exceptionally large crops.

The production last year would be reasonably satisfactory had there not been a great increase in the number of manufactories, railroads, etc., that depend largely for their support on this and other agricultural productions.

Erie earnings and expenses in October, including only 68 per cent. of the earnings, but the whole of the working expenses of the leased New York, Pennsylvania & Ohio Railroad, were as follows this year and last:

	1883.	1882.	Inc. or Dec.	P.c.
Receipts	$2,411,146	$2,375,585	+ $35,561	1.5
Expenses	1,567,778	1,501,278	+ 66,500	4.4
Net	$843,368	$874,307	— $30,939	3.5

Thus there was a trifling increase in the gross earnings, a greater increase in the working expenses, and a small decrease in the net result, which, it must be remembered, is not the aggregate net earnings of the two roads, but their net earnings after subtracting 68 per cent. of the gross earnings of the New York, Pennsylvania & Ohio, which is the rental which the Erie paid last October for this road. The result *to the Erie Company* is very different. Its net earnings in 1882 were $643,329 in October; in 1883, with the profit (or loss) on the New York, Pennsylvania & Ohio lease they were $843,368, or $200,039 (31 per cent.) greater, whether due to the lease or not we cannot say until we have the New York, Pennsylvania & Ohio figures for the month. This net receipts of the Erie in October for the seven years since the reorganization have been:

	Net receipts.		Net receipts.
1877	$604,553	1881	$625,678
1878	619,487	1882	643,329
1879	715,722	1883	843,368
1880	886,504		

Thus the net result to the Erie was much larger last October than in any previous year except 1880. It was, however, much less than in August and September. For the six months of the lease this net result to the Erie has been:

May.	June.	July.	August.	Sept.	Oct.
$631,055	$615,722	$616,773	$1,100,065	$1,037,413	$843,368

October is not usually a month of smaller receipts than those in September and August, but it was in 1882 as well as in 1883 on this road. The Pennsylvania last October had larger net earnings than in any other month of the year—15 per cent. more than in September and 3¼ per cent. more than in August; while the Erie's net, we see in October was 24 per cent. less than in August and 19 per cent. less than in September.

It was inevitable that the Erie's earnings should fall off from the extraordinary figures of August and September, and it will be doing extraordinarily well if it shall continue the rate of increase over its last fiscal year (31 per cent. shown in October, which, indeed, would add more than $1,000,000 to its net income for the seven months ending with April last, which was the part of that fiscal year previous to the lease of the New York, Pennsylvania & Ohio.

The Louisville & Nashville Railroad Company has reported its earnings and expenses for the last half of 1883, which is the first half of its fiscal year, showing, with substantially no increase of mileage, an increase of $901,388 (13⅛ per cent.) in gross earnings, of $333,536 (8 per cent.) in working expenses, and consequently an increase of $567,852 (21¼ per cent.) in net earnings—certainly an enormous increase, in itself equal to 2¼ per cent. on the capital stock. Subtracting interest, rental and taxes for the half year, the company reports a surplus of $1,073,443, which is equal to $4.29 per share of stock—the stock nevertheless selling for $44, so that the income reported is very nearly at the rate of 20 per cent. a year on the price. Evidently the investing public do not believe that this statement tells the whole story.

The year 1883 was exceptionally favorable for Southern roads, the effect of the extraordinarily large crops of all kinds in the South in 1882 being felt nearly to the end of 1883—some roads in November and many in December showing a decrease in earnings for the first time in the year. It was to be expected then that the Louisville & Nashville should show a considerable increase in gross and net earnings in 1883. But the company is reported to have a large floating debt, and there are some who doubt whether the working expenses given in the last report (when a profit of 92 90 cents per share was shown for the year) covered all that should properly have been charged to that account, while the report fails to give those details of expenses which are necessary to judge whether they were adequate. Certainly if the company earned 4 per cent. on its stock in the last half-year, the present price is a sad commentary on the want of faith and confidence of investors. The smaller crops of 1883, and the more unfavorable condition of business generally, are likely to reduce the earnings of this road in 1884, but we doubt whether it and the other Southern roads suffer as much as the Northern roads, because the dullness of business affects manufactures and new construction very much more than agriculture, and agriculture remains vastly the most important of the industries of the South.

The Mexican Central Railroad earned $1,623,368 on its Southern Division and $336,568 on its Northern Division in 1883, these earnings being in silver, which is the currency of the country, and which is discounted about one-seventh when converted into our currency. The average length in operation was about 330 miles of the Southern and 400 of the Northern Division. This makes the average earnings per mile of road for the year $4,900 on the Southern and $840 on the Northern Division. The latter is through a very thinly peopled and desolate country, and till it is opened through (which it is expected will be next spring) could hardly be expected to have any traffic worth mentioning. The Southern Division passes through a really thickly peopled country with several considerable cities on the line, which even with a very low condition of industry ought to be able to support a railroad amply. And the earnings on this division last year, if expenses are not extraordinary, should produce enough to pay interest on $25,000 to $30,000 per mile. Expenses there are increased by the great cost of getting supplies up from Vera Cruz, and by the scarcity and high price of fuel; wood being hauled sometimes 20 or 30 miles to the railroad. But when the road is opened through it can get iron and supplies without paying the enormous tolls of the Mexican Railway, and as its charter gives it the right to import its supplies free of duty, some of them, in spite of the long rail haul, will probably cost less than in this country. The Southern Division—say the southern 450 miles—since it has earned so much this year ought to be able to take care of itself hereafter. In 1882, with an average length of about 210 miles, it earned $1,069,485, or about $5,045 per mile—a very little more than last year. The unsolved question is what the Northern Division will do. There are about 500 miles of that across an extremely thinly peopled country which has not yet developed anything but the most insignificant business, as the earnings of $840 per mile show. But it will get the benefit of whatever through traffic the road may have, and whatever undeveloped resources the country may have there has not been time to develop since the road was opened. It is about 2,500 miles from New York and 1,650 from Chicago to El Paso, at the northern end of the Mexican Central, and thence to the city of Mexico is about 1,130 miles. Thus the distance from New York to the city of Mexico by this road will be something more than 3,600 miles or about 380 miles further than from New York to San Francisco. The distance from New York by sea to Vera Cruz and thence by the Mexican Railway is about 2,900 miles.

Northern Pacific land sales were about twice as great in area last December and the year before, but the sales were for a sum larger by only 15 per cent., which is due to much smaller sales of town lots. For the six months ending with December (the first half of the company's fiscal year) the sales were:

	1883.	1882.	Decrease.	P. c.
Acres	281,198	354,097	72,899	20.6
Amount	$1,207,827	$1,313,650	$106,324	8.1
Town lots	65,638	98,053	31,415	32.0
Total amount	$1,273,964	$1,411,703	$137,739	9.8

Land is a very important element in the prosperity of this country, and as the land east of the Missouri can be paid for in preferred stock, either it must be very much cheaper now than it was a year ago or the price must have largely advanced since last year. There is nothing to prevent any advance in prices that the company may see fit to make, so far as we know, but if there were none the company would probably become extremely unpopular in Dakota, where the leading industry, in spite of the great amount of wheat raised, is speculation in lands and town lots, which would be greatly injured by a great reduction in the price of the Northern Pacific's vast estate, at least in those parts of the territory where it still has a large amount of agricultural land. The bear movement in the preferred stock, which brought the price down nearly one-half in one-year, if no changes were made in prices of land, would thus be a bear movement in Dakota land.

The average price per acre of the lands sold in the last half-year was $4.25, against $3.71 in 1882. This is not particularly significant, however, as it may have been more valuable land that was sold this year.

The last half of the year is not that when land sales are likely to be largest, and in the first half of 1883 they were 407,139 acres, against 281,198 in the last half. During the year ending with June last the company's land sales were no less than 68 per cent. larger than the previous year, and much larger than ever before. The preferred stock is not taken in payment of lands west of the Missouri, which, now that the road is completed, we might expect to be a larger proportion of the whole than heretofore. In 1882-83, however, they were a smaller proportion of the whole than the year before. The sales west of the Missouri and the town lot sales last year, however, amounted to $1,692,000, which, if collected, would pay the interest on more than $27,000,000 of bonds. Buyers generally give their notes for a large part of the purchase price, however, but as the sales have now been going on a long time the payments coming due make the cash receipts from land very large. In the income account of the last fiscal year the Land Department is credited with a contribution of $1,511,000 to the income

We hear less now than formerly of the grain production of Hungary, and much of the success of American flour in competing with Hungarian flour in European markets where formerly the latter was thought impossible to equal; but Hungary has kept on raising grain nevertheless, and not only has maintained but has greatly increased its production, the government having encouraged the building of local railroads, which make a larger part of the country accessible to market. Hungary is one of the few European countries which produce a considerable amount of Indian corn, its production of that grain in 1882 having been 104 million bushels, and its total production of grain of all kinds 389 millions, 120 millions being wheat. This was 80 per cent. more than in 1881 and 43 per cent. more than in the year of largest production previously, which was 1878. And the increase from 1873 to 1882 was no less than 243 per cent. Only a few of our newer states can show a progress in grain-growing like that Hungary has about 128,000 square miles of territory, or a little more than Iowa and Missouri together, but it has nearly 16 millions of inhabitants. The country is much of it very fertile, and resembles in soil and climate many parts of the West. Its production of wheat in 1882 was greater than that of any two of our states ever has been, and about double that of Illinois in 1880. But the immense production of corn in some of our Western states has caused a few of them sometimes, with less than half Hungary's area, recently to equal it in total grain production. And Illinois even produced 444 millions of bushels of grain of all kinds in 1879 on its 55,000 of square miles, which is 55 millions more than Hungary's greatest production on its 128,000 square miles. But it is the *increase* of Hungary's production that chiefly concerns us, as it indicates that Europe has in itself undeveloped resources to supply its own wants. In fact, were the other Danubian country fairly utilized—Bosnia, Servia, Bulgaria and Roumania—they would probably produce a surplus equal to our total exports, while in Russia all Europe might be supplied if it were tolerably cultivated by farmers as skillful and intelligent as ours, and if it had an adequate transportation system. All these countries will make progress, and some of the Danubian states may make rapid progress, but it cannot be expected that any will increase production as rapidly as Hungary has done within the last ten years.

The Saginaw Valley in Michigan is one of the greatest lumber-producing districts of the world, its productions now going chiefly to the East and South. Formerly considerable shipments were made to Chicago for consumption in the West, but now the Eastern demand prevents this, and Chicago is supplied chiefly from the west shore of Lake Michigan and from Wisconsin, and much of the newer West gets its supplies from West Wisconsin and Minnesota. The product of the Saginaw Valley for 11 successive years in *thousands* of feet has been:

Year.	M ft.	Year.	M ft.
1873	619,877	1879	736,106
1874	573,634	1880	873,048
1875	581,558	1881	976,320
1876	583,951	1882	1,011,275
1877	640,166	1883	938,675
1878	574,163		

Thus we see that in the six years, from 1873 to 1878, inclusive, the production of this valley was almost stationary, less in the last than in the first year, and averaging 596,500 M. But after 1878 the production increased rapidly, until in 1882 it was 76 per cent. more than in 1878. The increase had been at a constantly decreasing rate, however: 28 per cent. from 1878 to 1879, 18 per cent. from 1879 to 1880, 12 per cent. from 1880 to 1881, and only 3.6 per cent. from 1881 to 1882. In 1883 there is a decrease of 7 per cent., making the production the smallest since 1880. Further, the stock on hand at the close of last year was 37,985 M more than in 1882, and the amount of lumber disposed of was 11¼ per cent. less than in 1881, the amounts sold or shipped for five years having been:

1879.	1880.	1881.	1882.	1883.
834,822	799,597	1,014,408	972,845	900,090

The very decided decrease last year following a small one

the year before has much significance, as the consumption of lumber varies with prosperity as does scarcely any other product of which we have statistics.

The sales and shipments of lumber at Toledo, which are very largely from the Saginaw Valley, were 182,192 M in 1883, against 253,743 M in 1882, showing a decrease of no less than 71,551 M, or 28 per cent.

December earnings have been reported since last week by eight railroads, four of which show an increase over 1882. All but three are Southern roads, and in the aggregate these Southern roads show an increase of $137,319, or nearly 4¼ per cent. The large gains are made of 12¼ per cent. by the Alabama Great Southern, and 24½ by the Florida Transit, against which the only considerable decrease is 25¾ per cent. on the little St. Louis & Cairo road, and 7¼ per cent. on the Great Pennsylvania.

Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads in 1884 as follows:

Cape Fear & Yadkin Valley.—Extended from Liberty, N. C., northwest 4 miles; also on the southern end, extended south to Rockfish, N. C., 1 mile.

Chester & Lenoir.—Extended from Hickory, N. C., northwes 3 miles. Gauge, 3 ft.

Maryland Central.—About 2 miles of track on this road in Harford County, Md., have been laid this year. Gauge, 3 ft.

South Florida.—Extended from Plant City, Fla., east 13 miles. Gauge, 3 ft.

This is a total of 23 miles of new railroad, making 27 miles reported to date for 1884. The total track reported laid to the corresponding date for 12 years is as follows:

	Miles.		Miles.
1884	27	1878	..
1883	37	1877	..
1882	39	1876	24
1881	47	1875	33
1880	62	1874	32
1879	..	1873	..

The statements include *main track only*, no account being taken of second tracks or other additional tracks or sidings.

The weather thus far this month has not been favorable for tracklaying, and not much new road is likely to be reported for some weeks yet.

Foreign Railroad Notes.

The annual report of the Italian railroads for the year 1882 has recently been published, nearly at the same time as the report of the Belgian railroads. Generally the European state railroad reports appear so late that much of their value is gone, though as changes are much slower there than here such dilatoriness is not so objectionable as it would be here, where the reports are usually much fresher, but much less carefully compiled and edited.

A brief notice of the career of what we would call the "General Manager" of one of the six great French railroad companies, who has just been appointed, given in the *Annales du Génie*, gives us some idea of the kind of training thought to qualify a man for such positions in France. M. Mantion, the manager appointed, was born in 1825, was a student in the Polytechnic School and the School of Bridges and Highways, began his career as a railroad man in the engineering department of the Eastern Railroad, and in 1852 went to the Northern Company, for which he built several lines. In 1857 he was made Director (Manager) of the Algerian Railroad Company, and in 1865 he became Manager of the Belt Railroad around Paris, where he remained until 1875, when he succeeded Couche (widely known in Europe as author of an encyclopedic work on railroads) as Chief Engineer of Maintenance of Way on the Northern Railroad. His health becoming poor about two years ago he was made Consulting Engineer of the Northern Railroad, and as such conducted the company's negotiations with the Government During this active service he has also for 20 years held the place of Professor in the course on railroads of the Central School of Arts and Trades, at Paris, in which he succeeded Perdonnet, the founder of the course and one of the ablest of French writers on railroads.

The Belgian State Railroads have recently submitted their report for the year 1882. At the close of the year the system included 1,887 miles of road, 94 miles having been added to it during the year. This system had cost the government $226,240,000, or at the rate of $119,890 per mile. The earnings of this system in 1882 were $22,220,656, which is $12,454 per average mile worked, an increase of $51 (0.4 per cent.) per mile over 1881. Of these earnings 64¾ per cent. was absorbed by the working expenses; leaving as net earnings $8,088,100, or $4,374 per mile of road.

The passenger traffic amounted to 47,986,402 passengers carried an average distance of 13.18 miles, which was an increase of 9.2 per cent. in passengers over the previous year, the average journey being almost identically the same. The increase was chiefly in the travel at lowest rates, and the passenger earnings increased only 7 per cent., the average receipt per passenger being 15.56 cents, or 1.18 cents per mile—the lowest in Europe, doubtless, but not as low as on some railroads in India. No less than 18 per cent. of all the travel was on commutation tickets, producing less than 5 per cent. of the passenger earnings, so that the average rates on this travel must have been extremely low. A large part of this travel is by workmen carried from villages near by to the places where the mines or factories are situated in which they work. The average fare paid by a commuter was 4.63 cents; by other classes of passengers, 17.86 cents. At these low rates the passenger earnings were 32½ per cent. of the total earnings. The whole passenger traffic amounted to 622,600,000 passenger miles on the 1,887 miles of road, which may be compared with the 432,000,000 on the 1,000 miles of the New York Central. The Belgian travel is at the average rate of 450 passengers carried each way daily over the whole mileage. By the Census of 1880 the number in this country was equivalent to 98 passengers each way daily over every mile of road; but some of our roads, besides the New York Central, have much more than the Belgian State roads.

The baggage traffic on the Belgian roads yielded about $187,000, and the express traffic $1,465,400, the latter being 6⅓ per cent. of the total earnings. The freight earnings were 57⅓ per cent. of the total earnings and 4⅓ per cent. more than in the previous year. The average receipt per ton (of 2,000 lbs.) was only 56 cents; the average receipt per ton per mile we are not able now to give, for lack of a statement of tonnage mileage, but it is much greater than on many American roads, the average haul being very short. At the same time it is probably much less, *for so short a haul*, than on most American roads.

The mileage of corporation roads in Belgium in 1882 was 914, and they earned about $7,925,000 gross and $3,686,000 net, or $8,670 and $4,033 per mile. One corporation road, 23½ miles long, was added to the state system during the year, which now includes 67.4 per cent. of the whole Belgian system of 2,800 miles.

TECHNICAL.

Locomotive Building.

The Western & Atlantic shops in Atlanta, Ga., have just completed a heavy new passenger engine for use on the fast express lines.

The Pittsburgh Locomotive Works last week delivered four engines to the Terre Haute & Indianapolis road, and have an order for five more, to have 18 by 24 in. cylinders and 5-ft. drivers. These are for use on heavy passenger and express freight trains.

The Rogers Locomotive Works in Paterson, N. J., discharged some additional men last week. This was done to equalize the work, some departments being ahead of others in their work.

The New York, Lake Erie & Western shops at Susquehanna, Pa., recently completed a new consolidation freight engine for the road.

The Wyoming Valley Manufacturing Co. in Wilkesbarre, Pa., is building for the mines of the Atchison, Topeka & Sante Fe Railroad Co. in New Mexico, a mine locomotive with 10 by 14 in. cylinders and six drivers. The height of this locomotive above the rails is not to exceed 5 ft. 6 in. at the highest point.

Car Notes.

The Delaware Car Works of the Jackson & Sharp Co., at Wilmington, Del., are quite busy at this time, and are working upon several large orders for different roads. They have just shipped to the Charleston, Savannah & Florida Express line six of their improved ventilated express cars for carrying fruits, vegetables, etc. They have also sent three first-class coaches to the Rochester & Pittsburgh road, and a train of passenger and combination cars to the new Gettysburg & Harrisburg Railroad.

The Pullman Car Works at Pullman, Ill., are building a number of new sleeping and buffet cars to run on the Kennesaw Route to Florida and Southern points.

The Boston & Albany shops at Allston, Mass., are building a number of freight cars for the road.

The Buckeye Car Works in Columbus, O., have been sold to the Baltimore & Ohio Co., for repair shops.

Bridge Notes.

The Milwaukee Bridge Co. in Milwaukee, Wis., has recently completed a highway bridge over the Red River between Moorhead, Minn., and Fargo, Dak. It is a drawbridge of considerable span.

The Passaic Rolling Mill Co. in Paterson, N. J., is preparing to begin work on a contract for the iron work for some five miles of elevated railroad in Hoboken, N. J., and vicinity.

Iron Notes.

The Scranton Steel Co., in Scranton, Pa., is running it mills single turn five days a week. The reduction, it is understood, is only temporary, there being plenty of orders for spring work.

The Pennsylvania Steel Co. at Steelton, Pa., has all its works in full operation after the usual stoppage over the holidays.

The rolling mill at Kittanning, Pa., has started up full double turn again.

The Black River Falls Iron Co. has been organized at Black River Falls, Wis., with $100,000 capital stock, to build a charcoal iron furnace.

The Oliver & Roberts Wire Co. in Pittsburgh is building a rolling mill to make wire rods.

The Pencoyd Iron Works of A. & P. Roberts & Co. in Philadelphia are making the angles and deck beams for a new steel ship to be built on the Delaware.

The Pennsylvania Iron Works at Lancaster, Pa., resumed work last week, paying reduced wages to their employés.

Isabella Furnace at Sharpsburg, Pa., has gone out of blast after a very short run.

Manufacturing Notes.

The Fort Pitt Boiler Works in Pittsburgh have recently completed an iron cupola of the largest size for Oliver Brothers' mill in Pittsburgh.

The Sykes Iron Roofing Co., a new organization, has bought the iron roofing works of R. G. Sykes in Niles, O., and has nearly completed an additional building.

The Pennsylvania Bolt & Nut Co., at Lebanon, Pa., has increased its capital stock from $25,000 to $75,000.

The Rail Market.

Steel Rails.—There are some large orders still to be placed, but only moderate transactions have been reported. Quotations continue at $34.50 to $36 per ton at mill, varying according to size of order, time of delivery and location of mill. All the rail-makers whose mills are so placed as to be worked with economy seem to be satisfied with the situation, and the outlook for work for the year is satisfactory; so much so that they are a little careful about making quotations.

Rail Fastenings.—Spikes are unchanged at $2.50 per 100 lbs. in Pittsburgh, and track-bolts are quoted at $3.75 to $3. Splice-bars are a shade lower, at 1.75 to 1.85 cents per pound. The market is quiet, but firmer than for some weeks.

Old Rails.—Old iron rails are quoted at $21.50 to $23 for tees at tidewater, and $24 for double-heads. The demand is not very active just now, and there is a good supply.

Large Gear Wheels.

A correspondent of the New York *Times* writes on Scranton, Pa., as follows, under date of Jan. 23:

"There is now standing in the main machine shop of the Dickson Manufacturing Co., this city, one of the largest wheels in the world, and the second of the kind ever made the first having been already shipped for service to the copper mines of the Calumet & Hecla Mining Co., on the borders of Lake Michigan. The combined weight of both wheels is 124 tons, and their cost in place will not be less than $50,000. The titanic wheel which occupies a position in the centre of the lofty and admirably equipped machine shop is a marvel of mechanical ingenuity, strength and skill, and has been made from original designs furnished by E. D. Leavitt, Jr., of Cambridgeport, Mass. Several mechanics and engineers from a distance have been here to examine and admire it, and the correspondent of the *Times* had the pleasure of seeing it to-day. The spur gear in the centre is 43 ft. in diameter at the pitch-line, 4½-in. pitch, 12-in. face, the teeth of which have all been milled or cut epicycloid, and are mathematically correct. There are 352 of these teeth on each wheel, and its circumference at the pitch-line is 135 ft. On each side of the spur-gear there are 25 double elevating buckets or pockets inverted, making in all 100 buckets, which are stationary on the inside of the periphery of the wheel, and are capable of scooping up at a single revolution nearly 2,000 gallons. The wheel will make four revolutions per minute, lifting 8,000 gallons in that space of time, or 480,000 gallons an hour. The office of this wonderful wheel is to remove the refuse from the copper ore. It will be set in solid masonry, with arches, through which the launders used for washing the ore will pour their contents, to be taken up by the buckets already referred to and deposited in outlet launders, placed at an elevation of 40 ft., which will afford a sufficient impetus to carry the waste into Lake Michigan.

"The enormous amount of refuse now made in the process of copper mining covers an acre of ground 1 ft. thick every 48 hours. This is a great drawback, and entails heavy cost on the company. It was to do away with this inconvenience, trouble and expense that Mr. Leavitt designed these massive wheels, one of which will be stationed at the Calumet, the other at the Hecla mine. The shaft upon which the wheel revolves is 30 in. in diameter, and is made of gun iron. It rests in ponderous pillow blocks having universal bearing. The centres of the wheel are octagon, and its mighty arms are made of wrought-iron lattice-work. They are pyramidal in shape, and, jutting out from a common centre, present an imposing appearance even in repose. The ends of the arms, which are called the bucket segments, are of cast-iron, and the spur segments and buckets are bolted to them. The entire affair is put together with turned bolts driven in reamed holes. The most important feature of the wheel is the manner in which the spur has been constructed. The teeth were milled and cut by an ingenious device suggested by such a herculean task, and especially planned and patented by Mr. Sidney Broadbent, the Superintendent of the Dickson Works. The mean time occupied in milling and cutting the teeth of one wheel, 352 in number, was 215 hours, and the probability is that with the old mode of milling it would take four times as long. The same process was used in the construction of the Brooklyn Bridge machinery, the company having received both orders at the same time. This big wheel will be driven by a steel spur pinion, the shaft of which is actuated by an engine of 175 horse-power.

"The Dickson Works are also building for the same company two of the largest locomotive fire-box boilers ever made, being 1,000-horse power each. These boilers are made of steel plate 9-16 in. thick. Each boiler will contain 199 3-in. diameter lap-welded tubes 16 ft. long. These boilers, when complete, will weigh 61 tons each, and will be used to work the mammoth machinery of the Calumet & Hecla Mining Co. They will be shipped to their destination this week."

A Feat in Mining Engineering.

At East Franklin colliery, on Thursday, was consummated one of the greatest feats in mining engineering that has been accomplished in the coal region, and is a signal instance of the power of mathematical calculations, as applied to the construction of works of this kind. The Reading Coal & Iron Co. contracted with a party from the oil regions about nine months ago to put an 8-in. hole down at this colliery, but on account of the inefficiency of the workmen it did not succeed. A few months ago the company contracted with Mr. McEchone, of Scranton, to continue the work. As the hole is to be the passageway for a cable, and is 760 ft. in depth, some fears were entertained by Mr. George Patterson, Resident Engineer, that the mines would not be pierced just where it was intended they should be; but when the drills struck bottom they were not a half inch out of the way of their calculations.—*Pottsville (Pa.) Miners' Journal, Jan.* 18.

Notes from the Cab.

The following "Notes from the Cab," which are worthy of attention, although every one may not agree with the writer, we take from the *Journal of Railway Appliances* of Jan. 15:

"I wish some men who design engines had to work on them a while. There is our 136, an excellent Manchester, yet her cab is set back so far that, unless a man has unusually long legs and arms, he must take a step back and one forward for every scooptul of coal he gives her. The distance from the boiler head to the tank should never be so great as to require this, when the tank is full.

"Reverse lever latches are frequently so arranged that it is almost impossible to open the hand wide enough to embrace them. Draughtsmen should think of these little points in designing engines.

"Would it not be better to make the bind truck of tenders centre-bearing and the front one side-bearing, in place of the reverse—which is the custom at present? It would make a better combination for backing, and be in no wise less satisfactory for running forward.

"The coppersmith who put the injector on the 123 is a bright and shining light among his species. He got the steam-pipe in such a position that it is impossible to put the lever into the full stroke notch in forward gear without burning your hand—unless you wear gloves—and you can't reach the sand-pull without getting your wrist into the same disagreeable contact.

"The other day I was leaning out of the cab window watching the guides spring from the pressure of the cross-head. In running forward the lower pair kept bobbing up and down, and in going backwards the upper ones played the same trick. Now those guides are intended to prevent

the piston rods from springing, and if they don't do it they should be altered until they do. When I had the 'hog' a couple of weeks ago I noticed that the guides were rigid; but then there are only two of them, and they are each as heavy as the four on my engine.

"Do our M. M.'s put back boiler braces on their engines just because some one else had them on before? If the b. b. b.'s have slotted bolt holes in their feet they do no good to the engine; and if they are not slotted they are a positive injury, causing the frames or the boiler—or both—to spring and warp out of line with every variation of temperature.

"A friend of mine, employed in the A. T. & S. F. shops, drew a line through an engine while she was hot one day. She had been carefully lined up while cold, but his line showed her to be 2 in. out!"

Safety Frogs.

The Massachusetts Railroad Commissioners have issued this circular: "The death of David B. Quay occurred on Jan. 11 in the yard of the Boston & Albany Railroad, while he was coupling freight cars. They belonged to the Boston & Albany Co., and were fastened by link and pin. As Mr. Quay stepped between the sixth and seventh cars to pull the pin, his foot was caught in a frog and he was run over by cars 6 and 5 and instantly killed. His death was due to the want of an automatic coupler and to the use of unblocked frogs. The same causes of accident and death exist on all the railroads in the state, and this seems a fit occasion to call attention to the danger. The Board can add nothing to what has been already said as to the desirability of guarding the lives and limbs of employés by the use of automatic freight couplers. But the danger arising from the use of frogs unprovided with any safeguard has received little attention in this state. The Commissioner of Michigan says in his last report: 'The deadly frog last year killed four and mutilated 17 other employés; and the last Legislature passed a law requiring railroad companies to so adjust, fill or block the frogs, switches and guard rails on their roads as to prevent the feet of employés or other persons from being caught therein. The law takes effect on Jan. 1 next' [1884]. Learning that the Flint & Pere Marquette Railroad had been the first to comply with this statute, a letter from its Superintendent was procured through the courtesy of its President, the Hon. William W. Crapo, from which an extract is given. The letter also speaks highly of two different self couplers used on a portion of the company's freight cars:

"'In regard to the frog, you say you would like to know just how this blocking is done on our road, and how it works. In answer to this, I will say that the blocking is done by a strip of hard wood shaped to conform to the web of the rail, and bolted in with carriage bolts in such a manner that it is impossible for a person to get a foot caught and be held by the rails. The blocking that we use is known as the Hart patent. Mr. Hart's address is Clinton, Ia. I have no cut or description of this, but will make a rough sketch, showing an end view, as applied to the rails. Works satisfactorily.'

"The method above described of guarding frogs is generally preferred by railroad men to the strong spring in use upon some roads, which gives under the force of the wheel, but does not yield to the tread of a man. It would be a credit to our railroad companies if, without waiting for a statute, they should make provision for the saving of life and limb, such as has been made on the roads of Michigan under the compulsion of law, and the subject is earnestly commended to their attention."

New Stock Cars.

The new stock-cars, which were recently constructed at the Allston car-shops, and known as Lincoln's patent, arrived at the Brighton stock-yards yesterday morning from Chicago, loaded with cattle, it being the first trial trip. The train consisted of 30 cars, and left Chicago Friday noon, making the trip in 88 hours. The cattle were not unloaded from the time they left Chicago until they arrived in Brighton, and when they came out of the cars this morning they appeared as fresh as when loaded in Chicago. They were fed and watered several times during the trip, arrangements for which the cars provide, and the drovers who came with the cattle report that everything worked satisfactorily. The quickest run the train made was over the New York Central, from Buffalo to Albany, 300 miles, in 14 hours. From Albany to Brighton, about 200 miles, the running time was 19 hours. The cars are 34 ft. 4 in. in length, and, with 16 cattle to a car, it will admit of a portion of them lying down without being trampled upon. The hay can be put in through doors on top of the car, and the arrangements for watering are galvanized-iron troughs on each side of the car, which can be filled from water-tanks, and when they are not in use can be turned over out of the way.—*Boston Advertiser, Jan.* 16.

Wind Pressure.

Observations taken by the engineers employed on the new Forth Bridge in Scotland, during a wind storm which prevailed throughout Great Britain on Dec. 12 last, showed a pressure varying from 21½ to 38½ lbs. per square foot. Observations at Wexford, Ireland, on the same day, showed a maximum pressure of 28 lbs. per square foot. This question of wind pressure, as most of our readers know, has received a good deal of attention from English engineers for some time past—in fact, ever since the fall of the Tay Bridge, four years ago.

Locating the Piers of the Forth Bridge.

In a description of the work on the New Forth Bridge in Scotland the *Engineer* says: "To fix the position of the piers of a bridge having two clear spans of 1,700 ft. and two of 700 ft. across a channel 200 ft. in depth, is not easy, and a few words may be said about it. The Forth banks are more or less precipitous and the country undulating, so that it was difficult to get a base line for a trigonometrical measurement. At the request of Mr. Fowler the Ordnance Department kindly sent a party of sappers to recover the old stations used in the Ordnance Survey of Scotland, and to take the necessary additional observations to determine the width across the Firth of Forth. The calculated result differed about 1 ft. from that obtained by Messrs. Fowler and Baker. To measure off the 1,700 ft. that length was first measured with exactitude along a straight piece of the North British Railway, and posts of a certain height fixed at each end. A steel pianoforte wire was then hung from these posts with a sag or droop of 24 ft. at the centre, and marks were fixed to each end of the wire to indicate the 1,700 ft. length. The wire was then coiled on a roller and taken on board a steam launch, from which it was laid across the channel of the Forth. It was then hauled up above the surface of the water till it hung with the original droop of 24 ft., when, assuming the temperature to be the same, the marks put on the pianoforte wire should indicate the required span of 1,700 ft. This process was repeated several times and the wire taken ashore to the railway to test whether it had stretched; but all the observations were in accord. The sensitiveness of this simple mode of measuring the span with a wire weighing only 8 lbs. in all will be seen when it is stated that when Mr. Baker slacked out the wire only ¼ in. in the 1,700 ft., an observer in a boat in the centre of the Forth at once signalled there was too much droop in the wire. At another time he signalled that it was too high, but a reference to the thermometer showed the temperature had fallen 2 deg., so that the wire proved itself a most delicate indicator of changes of temperature."

One Cause of Broken Wheel Flanges.

For a week or two past there has been considerable trouble on the Cincinnati, Indianapolis, St. Louis & Chicago road from broken flanges on the wheels of passenger trains. The inspectors at Indianapolis, according to the Indianapolis *News*, have found wheels with broken flanges under one engine truck, four mail cars and three passenger cars. It was decided that the trouble must be caused by a frog somewhere, and a careful search by the Road Master revealed one at Lawrenceburg which was a little out of place, so that the wheel flanges struck it in passing.

THE SCRAP HEAP.

The Fidelity & Casualty Co.

The annual report of the Fidelity & Casualty Co., of New York, for 1883, shows that the income of the company for the year was $384,562, and the expenditures, including dividends, $326,269. The losses paid and incurred during the year in the different departments amounted to $117,000, being about 1¼ per cent. lower than the loss rates for 1882. The income exceeded that of 1882 by $103,000. The Fidelity Guarantee Department showed an income of $78,130, an increase of $32,413. The assets reported amount to $470,788, and the net surplus to $50,623, being a net improvement over 1882 (after paying $20,000 in dividends) of $25,518. The operations of the company have been largely extended within the past few months.

Railroad Young Men's Christian Association.

The Railroad Department of the Chicago Young Men's Christian Association reports for the year 1883, at the Forty-seventh street rooms, a total of 29,396 visitors. Seven entertainments and 53 religious meetings were held, and there were 28 sessions of the educational classes and 21 of the Bible class. There were 3,407 visits made, including 138 to sick persons and families, and 22,722 papers and invitations were distributed. There were 157 new members received.

At the Stewart avenue rooms 26,728 visitors are reported; 189 meetings were held and 15 entertainments given. There were 3,402 visits made and 41,377 papers distributed. The library and reading-rooms were largely used.

At the Kinzie street branch 32,810 visitors are reported, with 113 meetings held and 10 lectures and entertainments given. There were 2,754 visits made and 64,570 papers distributed. Here also the reading rooms and library were largely used, and tthe rooms have been of benefit to a large number of trainmen and others.

At all the rooms books and papers are needed, as well as other contributions which may serve to make them attractive. The current expenses are met by subscriptions from the railroad companies.

The Railroad Lunch Counter.

Of all the pernicious institutions of this country the railroad lunch counter is the most noxious, pestiferous and infamous. It has not kept up with the march of progress nor advanced with the improvement of the age. You always approach a lunch counter—especially if it is one you have never visited before—with hope and you leave it in despair. As you climb upon a high stool and stick your elbows in a lump of grease on the counter you are cheered by the sight of the glittering nickel-plated coffee urn, and a feeling of sanguine expectancy creeps over your inside as your eye ranges over the cards hanging behind the counter which read: Turkey, 10c.; Coffee, 10c.; Lamb Chops, 15c.; Pies of all kinds, 10c.; Oysters, every style, 15c.; etc. The man who waits on you wears a dirty apron and a sad tired-of-life-and-of-dishing-out-pies-and-coffee expression of countenance. When you attract his attention and give him your order he goes off with great enthusiasm to get it, but he is stopped by the hungry mortals all along the line of the counter, who clamor for various articles of food. He dashes a dab of butter on a little plate at the man in the linen duster, jams an empty plate under the nose of the red-faced man with the cinder in his eye, throws a plate of doughnuts to the drummer who is trying to suppress his ravenous appetite with pickles, fills the brakeman's order for a glass of cold tea and a 10c chunk of custard pie, and flings a ham sandwich at the sleeping-car porter who carries it off to gnaw it at his leisure in the retirement of the sleeping-car dressing room. Then there is a clash of plates and glasses, and of knives and forks that turn around in their handles, and the sad-eyed miscreant brings you the coffee and turkey with a take-it-or-leave-it-just-as-you- —— -please air. Before he comes back with the salt and mustard an interval elapses during which he serves seven more hungry passengers, and dives into an ante-room where he seems to you, to rest five or six minutes. You feel that your system demands bread. You imagine that the "Fifteen minutes for refreshments" are about up, and, in desperation, you load your internal economy with indigestible doughnuts, because you are afraid to wait for the bread, and you scald the lining of the roof of your mouth with the hot, gritty fluid called coffee. Everything is gritty and tastes of coal dust, and you feel uncomfortable and unclean, and you wish you were dead. Then you pay the cajtiff behind the counter 50 cents, and you wish you were dead some more while you rush out thinking that the train is moving off, but you find that you have only been pampering your appetite in the banqueting hall for five minutes, and that you have yet 10 minutes to spare, and you go back to the lunch counter and buy two cigars for a quarter. As the train pulls out and goes thundering past farm-houses, where you know are stacks of home-made pies, piles of flaky biscuits, churns full of hilarious buttermilk, and tables groaning with yellow-legged chickens and mealy Irish potatoes, you curse the railroads that allow the grasping, hydra-headed and smoke-begrimed lunch stand monopoly to exist, and by that time your two-for-a-quarter cigar begins to swell up in the middle and fray at the edges. You, out of consideration for the feelings of the other passengers, leave the smoking car and finish the cigar on the rear platform, where the winds carry the 12½ cent effluvia out into the adjacent settlements, and makes the honest granger think that the cholera has come at last.—*Texas Siftings.*

The First Railroad in Oregon.

Several persons were on Monday discussing the subject of Transcontinental in a public office just as an *Oregonian* reporter called. Among the number who were supposed to have lost money in this stock was named D. P. Thompson. One of the persons present stated that he did not believe that Mr. Thompson has lost a cent by Transcontinental. Of course there was no way of settling the matter at the time, but the reporter, meeting Mr. Thompson later, with his usual modesty asked him if he was out anything on Transcontinental.

"Not a cent," was the reply. "I never owned a dollar's worth of Transcontinental or Northern Pacific, common or preferred, or of any other railroad stock, except some in the Oregon City Railroad."

"What road was that?" asked the reporter. "I never heard of it."

"That road," said Mr. Thompson, "was the first railroad ever built in Oregon, and ran from Oregon City to Canemah. It was built by a company consisting of W. C. and J. D. Dement, General A. L. Lovejoy and myself."

"Was it a paying concern?" asked the reporter.

"Well," was the reply, "the road, rolling stock and mule for locomotive, all cost $23,000. In one year it earned $48,000. You can see that it paid very handsome dividends. It just spoiled me for wanting any stock in railroads as they are now managed."

"I suppose it was a monopoly," said the reporter.

"I am afaid it was, as after Medorem Crawford and his ox team had retired from the business we had the whole of it."

"Was there any howl against the monopoly?"

"Although we charged only $1 per ton for freight and 25 cents for passengers over one mile of road, I am afraid that some of the people up the valley did curse the concern, but it continued to thrive nevertheless."

"Two bits per passenger was rather steep, even for a monopoly," said the reporter. "I should suppose that many travelers would walk from the lower boat to the up river one."

"Some of them did try that, but about the time they got half way the train would come along, the mule puffing like a locomotive, and then the boat, by previous arrangement, would give several short, sharp toots, of her whistle, and the travelers would scramble aboard the car in a hurry and pay two bits for riding half way."

"When they found that the boat did not start at once did not some of them kick?"

"Occasionally one would. I remember that A. A. McCully, who was a stockholder, expressed some indignation over this arrangement one time when he had walked half way up and rode the other half."

"You say it was the first railroad built here; who superintended its construction?"

"I did," said Mr. Thompson. "I had never seen a railroad, either. I had surveyed several, but always kept ahead of them."

"What year was the road built?"

"In 1861. I remember that we once took in $75 in greenbacks, the first we had ever seen, and we did not know what to do with them; so the directors played seven-up for the lot. That was my only experience in gambling."

"What became of the road at last?"

"Well, it was bought by the People's Transportation Co., who gave us a lot of stock in the company, and we bought enough to have a controlling interest and run the concern. But at length the Salem stockholders put up a job on us and watered the stock. I raised a row at the next meeting of the board and was bought out at 50 cents on the dollar. Shortly after that Ben Holladay bought out the whole concern at about 35 cents on the dollar, and that was the end of the whole affair."—*Portland Oregonian, Jan.* 11.

Smokers.

The fact that all the occupants of the smoking-car escaped uninjured in the late smashup is a tough nut for the anti-tobacconists to crack. Pass us another mild Carolina.—*San Francisco Evening Post.*

A Detroit man has been at work for two years past to invent a model cattle car. His great trouble is to arrange the upper berths so that Texas steers can get into them.—*Free Press.*

Another railroad accident. It does sometimes seem as though the only way to prevent these catastrophes is to have a man walk ahead of the engine with a hammer and a few nails.—*San Francisco Evening Post.*

A Philadelphia man in a sleeping car went through a terrible accident, in which the sleeping car rolled down an embankment, without waking. It was noticed, however, that as the car struck the bottom he murmured: "Don't; I'll get up and start the fire."—*Philadelphia Call.*

Track-Laying in Mexico.

It was now dark, and we could see nothing except many dusky forms and the light of tiny camp-fires, where the laborers' evening meals were in preparation. In the morning the ground was covered by a white frost, which soon vanished before the hot sun. The work of track-laying was in lively progress. Track-laying, as well as most other kinds of work, has distinctive peculiarities in Mexico. You may, perhaps, fancy a gang of noisy Irishmen in turbulent toil, a few rude shanties around, much whiskey in the air, and the ground strewn with tin cans and empty bottles. The picture would hold good of any track-laying scene in the far West, but not in Mexico. Here the labor is all Mexican, that is to say, pure Indian, with slight exceptions, and the only camp débris left when the work has passed on consists of bushels of tuna skins. The only white men are the master tracklayer, the locomotive engineer and the fireman, the civil engineer who is setting the stakes to guide the surfacing gang, and the cook. The foremen of the tracklaying gangs are Mexicans.

All appears to be confusion, and the spectator wonders why the men lugging all sorts of material and engaged in all sorts of work do not tumble over each other. But really the strictest order prevails. The Indian laborers work steadily and without noise. They are well trained and many of them have been engaged in the work ever since the track left the city of Mexico. One gang carries the cross-ties forward and arranges them; boys run ahead and drop the spikes, fish plates or angle irons, bolts and nuts, just on the spot where they are wanted; another gang loads the rails on to little flat cars, which are pushed forward over a brand new track as fast as it is laid, where the rails are unloaded and carried forward by other men detailed for the purpose. The rails are laid on the cross ties in their proper position, those on the right following a chalk line marked on the ties by a string, while on the left they are placed at the exact distance from the opposite line by means of a gauging stick. The rails are secured together by bolts and nuts through the angle irons or fish plates, as the case may be, which connect them, only two bolts being used at first, the other two being put in afterward, the design being to have the rails ready at the earliest possible minute for the flat cars, with material to be pushed over them.

As soon as the rails are joined the spikers come to the spot, two at each joint, one within and one without the rail, wielding lusty, unerring blows in alternate succession, like two blacksmiths at an anvil. The same men also drive the centre spikes at each rail, when the track is ready for the little flats aforesaid. Other spikers and bolt fasteners come along and complete the work. When there are pine ties, two blows at the utmost will drive a spike into place, but with the hard ties of oak and mesquite it takes several blows. These latter ties are mostly very uneven in size, and therefore it takes a considerably longer time to lay the track than with uniform ties of pine, or with those which are sawn or hewn to a regular size, as upon most of the roads in the States. This difference in the size of the ties makes more work in levelling up, a task which must be done

before anything heavier than the little material flats can pass over the rails. The levelers come directly behind the track-laying gang. The rails are raised to exactly the required level by means of jackscrews, and the gravel or ballast is scraped or shoveled in under the cross-ties to keep them in place. The track is then ready for the cars. But a ballast train follows immediately along behind, filling in between the ties with the needed ballast, and within 15 days at least the track is in perfect order for regular operation. The thorough construction of the Mexican Central is shown in its ballasting. Instead of laying the track on the bare grading and then filling in with ballast afterward, the line is thoroughly ballasted at the time the grading is done, giving the best kind of a road-bed. The ballast all along the line is excellent, a great proportion of it being broken rock, like that on the Pennsylvania Railway, while the rest is of tepatate of various degrees of hardness.—*Correspondence Boston Herald.*

She was too Sharp for Him.

She was a handsome young woman. This was remarked by a dozen different people as she entered the Union Depot. She was going east by the Canada Southern. This was remarked by a conceited young snip of a fellow who looked "masher" from the crown of his hat to the heels of his gaiters. She had no sooner purchased her ticket and taken her seat than he began to circle around. She saw him and read his character, and beckoning him to approach, she asked :

"Are you going to Buffalo ?"

"Yes—ah—certainly."

"I am glad to hear it. Will you do me a favor ?"

"With all my heart. Command me."

"I am afraid my trunk was left at the hotel. Could I ask you to run up and see about it ?"

"Of course—certainly—only too happy."

It was 20 minutes to train time. He was back in 16, his face flushed, his ears red and his breathing spasmodic. He had done some tall running. The trunk was not there.

"Oh, dear, but would you be so kind as to look into the baggage-room ?"

He would. He did. He ended a score of trunks around, made a dozen inquiries for a Saratoga with an "E" on the ends, and finally returned to the waiting-room to say:

But she wasn't there ! The train was also gone ! A man who had a sore throat and felt mad at the whole world informed him that he had no sooner started for the baggage room than she picked up her recticule and boarded the train, her face wearing a happy smile and her rosebud mouth gently puckered up as she hummed: "The chap I left behind me !"

"And it looks to me," added the ill-natured invalid, "as if it was a put up job to choke off your society."

"Hanged if it wasn't !" gasped the other as he sat down to rest his knees.—*Detroit Free Press.*

About Forgotten Baggage.

Twenty-three years ago the Consolidated road moved into its present depot at Bridgeport. Seven years previous, when the depot was at the foot of Union street, a trunk was received with a local check to Bridgeport; when the road moved into the new depot it was taken along. And ever since it has been, during these 30 years, a care to Mr. Doyle. In 1863 a man brought a tool chest, asked the privilege of leaving it a few days, and offering to pay storage in advance, but Mr. Doyle told him to wait till he called for the chest.

The following year a letter came from Alexandria, Va., wishing to have the box sent by express, but, on notifying the owner of the refusal of the express company to take the risk on account of the war, it was held till he was heard from. The tool chest still remains and 20 years have passed by. Eleven years ago a trunk was received. Eight years after a man presented the check. Mr. Doyle figured out the charge at the usual rate of 25 cents a day, which only amounted to $730, but believing in ready cash he offered a fair reduction and said, "give me a couple of dollars and call it square." The man said that certainly was reasonable and he would call in the morning.

Three years have passed, and so far he has forgotten to call. A valise that had been underfoot for nine years was accidentally broken open and a bank-book, with a credit of $300, fell out. Mr. Doyle advertised it in the local papers, and a party from East Bridgeport presented the check. Beside the book were many valuable trinkets. The owner somehow forgot to thank any one for his good luck, and whined off all charges. The unclaimed baggage would make several cartloads. Much of it is held as security for unpaid car fares. The amount slowly increases, but the road makes no provision for its removal.—*New Haven (Conn.) Register.*

A Crazy Engineer.

A startling event happened at an early hour one morning recently in connection with the mail train from Brest (France), which is due in Paris at 4:50 o'clock. While proceeding at full speed the passengers observed the brakes to be put on with such suddenness that fears were entertained that a collision was imminent, especially as the spot at which the train was drawn up was in utter darkness. Upon the guard reaching the engine he found the stoker endeavoring to overpower the driver, who had evidently lost his reason. After blocking the line the guard joined the stoker, and d succeeded in securing the unfortunate man, but not until after he had offered a desperate resistance. The locomotive was then put in motion, the nearest station was reached without further misadventure, and the driver was placed in custody. The train ultimately arrived in Paris after two hours' delay.

The Smoking Car.

Many men, though they may not wish to smoke, on taking a train for a short trip usually prefer a seat in the smoking car. They say that in case of a crowd when once they get a seat in the smoking car it is theirs until they choose to give it up. Besides, they like the company. It is free and easy, good natured and jolly. One seldom sees a sour face in a smoking car. If there is one it soon vanishes to the rear after it has finished puffing its own cigar. Most of the pleasant stories of the train are told in the smoking car and many good songs are there sung and no one objects to music or hearty laughter. Contagious diseases and insects don't like to hang around in the tobacco smelling upholstery of the old "smoker," often older and more rickety than it ought to be. The good railroad manager provides a comfortably constructed, bright, cheery coach for his cigar loving passengers, and so they bless him. The smoking car is one of the institutions of American travel. Long may it roll.—*Yonkers (N. Y.) Gazette.*

Cold Weather on the Brooklyn Bridge.

"Oh, no, I ain't froze," said a brakeman with a red nose on one of the Brooklyn Bridge cars yesterday, as he gave a wrench to the grip and started off for Brooklyn. The wind came whistling through the station on the New York side, but the brakeman stood to his wheel manfully, only slapping his chest occasionally in a spasmodic way to keep up the circulation. "This is awful cold work," he continued. "The Brooklyn Bridge is about the coldest place in the United States any way, and when it blows hard it is enough to freeze a man to death. We have to stand outside on the platform and work the grip, and the cold goes right through a feller. Some of the boys can't stand it at all. Half a dozen of them were laid up last week; one had his nose nearly frozen off him, and another most lost his fingers and toes." Five of the cars were heated yesterday, but the heating did not seem to be very thorough, and the passengers shivered. The method used is that of salt water in pipes running around the car, warmed by a sort of stove arrangement in one corner. The corner where the stove is placed is thus nicely heated, and in warm weather the rest of the car will also be quite comfortable.—*New York Times.*

Drunk on the Track.

As extra 36 was coming east last Monday over the Susquehanna Division the engineer discovered a team standing on the westward-bound track near Waverly. He stopped his train, when it was discovered that the team were fast in a cattle-guard, and the two occupants of the sleigh fast asleep and drunk in the bottom of it. An approaching westward-bound train was flagged just in time to prevent the rig and its drunken occupants from being run down, after which the horses were liberated and the men woke up. —*Fort Jervis (N. Y.) Gazette, Jan.* 16.

Transportation in Congress.

In the Senate on the 17th :

Mr. Van Wyck (Neb.) introduced a bill to secure reasonable rates of transportation to the people over railroads aided by the issue of United States bonds and public lands. This bill Mr. Van Wyck said he desired to introduce as a substitute for the bill of similar character introduced by him a few days ago. The first bill was limited in its scope to the Union and Central Pacific railroads. The present bill extends the regulating provisions therein contained to all railroads in the United States which had received government lands.

In the House on the 17th:

A bill was taken up to amend Section 4,887 of the Revised Statutes so as to read as follows:

"Section 4,887. No person shall be debarred from receiving a patent for his invention or discovery, nor shall any patent hereafter granted be declared invalid by reason of its having been first patented or caused to be patented in a foreign country, unless the same has been introduced into public use in the United States for more than two years prior to the application; but every patent hereafter granted for an invention which has, prior to the filing of the application for said patent, been patented in a foreign country shall expire 17 years from the date of the foreign patent, or, if there be more than one, 17 years from the date of the earliest foreign patent, and in no case shall it remain in force more than 17 years; but all applications hereafter made for patents for inventions previously patented in a foreign country upon the invention of the same person shall be made within two years from and after the date of such foreign patent, or, if there be more than one, from the date of the earliest foreign patent. No patent granted for an invention which had, prior to the grant of such patent, been first patented in a foreign country, and which has not expired at the date of the passage of this act, shall be declared to be invalid by reason of its not being so limited on its face or in its grant as to expire at the same time with the foreign patent, or if there be more than one, at the same time with the one having the shortest term; but this act shall in no wise renew, revive, prolong or extend any patent heretofore granted."

After a long debate the bill was recommitted with instructions to the Committee on Patents to report it back with a provision that in any action against the innocent purchasers of a patented article, manufactured in violation of the right of the patentee, the measure of damages shall not exceed the cost in open market of the article so manufactured.

In the Senate on the 21st:

Mr. Edmunds (Vermont), introduced a bill to amend the act granting aid for the construction of a railroad and telegraph line from the Missouri River to the Pacific Ocean, and to secure to the government the use of the same for postal, military and other purposes, approved July, 1862, and the bills amendatory thereof, one of which provides for the settlement of the claims of the United States and to secure to the United States the indebtedness of the companies to them.

In presenting this bill, Mr. Edmunds said that it had been prepared by the Commissioner of Railroads, and is a very important bill. Its object is, if possible, to bring to a termination the controversy, which appears to be perpetual, between the United States and these railroad companies as to what they should pay in, and to provide for opening up the transactions by a new arrangement on a long bond, to take the place of the obligation of the companies to repay the United States, to provide legal securities for such repayment and methods for the enforcement thereof. Referred to the Judiciary Committee.

In the House on the 21st:

Mr. Dunn (Ark.) introduced a bill requiring the Secretary of the Interior to ascertain what railroad companies, their successors or assigns, are indebted to the government for the cost of surveying, selecting and conveying lands granted to them by the United States, and to give notice to the president or treasurer of such companies that he is ready to deliver a patent for land which the companies would be entitled to if that cost were paid. If within two months from the date of notice the costs are not paid, the Attorney General shall institute proper proceedings against such companies. It also directs the Secretary of the Interior to issue patents conveying title to all lands granted to railway companies which have been legally earned by virtue of the completion of their reads within the time required by law.

Mr. Libbey (Va.) introduced a bill authorizing the extension of the Chesapeake & Ohio Railroad to Fortress Monroe.

Mr. Holman (Ind.) moved to suspend the rules and adopt the following resolution :

"*Resolved*, That in the judgment of this House all the public lands heretofore granted to states and corporations to aid in the construction of railroads, so far as the same are subject to forfeiture by reason of the non-fulfilment of the conditions on which the grants were made, ought to be declared forfeited to the United States and restored to the public domain.

"*Resolved*, That it is of the highest public interest that the laws touching the public lands should be so framed and administered as to ultimately secure freeholds therein to the greatest number of citizens, and to this end all laws facilitating speculation in the public lands, or authorizing or permitting the entry or purchase thereof in large bodies, ought to be repealed, and all the public lands adapted to agriculture, subject to bounty grants, and those in aid of education ought to be reserved for the benefit of actual and *bona fide* settlers, and disposed of under the provisions of the homestead law only.

"*Resolved*, That the Committee on Public Lands is hereby instructed to report to the House bills to carry into effect the views expressed in the foregoing resolutions, and that it shall be authorized to report such bills at any time, subject only to revenue and appropriation bills; and the same shall be in like order entitled to consideration."

The rules were suspended and these resolutions were passed, 251 to 18.

Southern Railway & Steamship Association.

The Board of Arbitration of the Southern Railway & Steamship Association has made the following decision and award in the case of certain cotton shipments at issue between the Central, of Georgia, and the Georgia Railroad companies on the one hand, and the East Tennessee, Virginia & Georgia Co. on the other:

Acting under the following resolution, adopted by the Executive Committee of the Southern Railway & Steamship Association, at a meeting held at Atlanta, Dec. 6, 1883:

"*Resolved*, That the question as to whether the cotton shipments, referred to in the resolutions of the board of directors of the Central Railroad of Georgia shall be pooled (including all that may be carried under same conditions up to March 1, 1884), be referred to arbitration by Messrs. John Screven, Thomas H. Carter and E. K. Sibley, and that the present contract and officers of the Association be continued until March 1, 1884."

The undersigned Arbitrators have taken the subject matter, with the printed arguments and printed documents referred under careful consideration, and award as follows:

This case came before the Arbitrators at Atlanta on the 15th, 16th and 17th of January, 1884.

The Articles of Agreement adopted by the Southern Railway & Steamship Association on Jan. 17, 1883, classify the business of the railroad companies of the Association into "joint" and "local" business. The former is placed under the jurisdiction of the Association, the latter is excluded from it. "Joint" business is referred to in the preamble of the agreement as "business in which they (the transportation companies) have a common interest," and again as "traffic common to two or more companies." "Local" business is not defined, but the inference is left that for the purposes of the contract it is business not "joint." The class mentioned in some of the arguments as "through" is not recognized as a class in the Articles of Agreement.

Prior to the adoption of the Articles of Agreement, as a general rule, there was a division of all cotton at competitive points. But the last part of the 5th Article of this Agreement provides that "The Executive Committee shall have jurisdiction over all matters relating to the joint traffic, but shall act only by unanimous consent of all its members. In event of failure to agree, the questions at issue shall be settled by the Board of Arbitration hereinafter provided for. But this shall not be construed to give the Executive Committee or the General Commissioner any control over the local business of any company, even though such local business may of necessity pass through points at which the traffic is divided by apportionment."

Notwithstanding this new provision in the agreement, the old rule of division of business at Macon and Atlanta, and at stations on the Western Railroad, of Alabama, and the Atlanta & West Point Railroad, continued in operation until Sept. 13, 1883, when the General Commissioner inclosed the following letter of Sept. 8, 1883, to the Vice-President and General Manager of the East Tennessee, Virginia & Georgia Railroad Co., and to other companies interested :

[COPY.]

"OFFICE OF PRESIDENT,
CENTRAL RAILROAD & BANKING CO. OF GEORGIA,
SAVANNAH, Sept. 8, 1883.

"*Mr. Virgil Powers, General Commissioner :*

"DEAR SIR—The Western of Alabama and the Atlanta & West Point R. R. being controlled by this company and the Georgia, we consider it as much our local territory as the other roads we work in connection with our system by virtue of control, and we are unwilling to make any division of the business with other lines, but request that it be apportioned between the Georgia and Central Railroads—one-half each.

"I believe it is understood that Newnan will be divided the same way. Respectfully yours,

[Signed] "W. G. RAOUL, President Central R. R. of Ga.
"J. W. GREEN, G. M. of Georgia R. R."

The Vice-President and General Manager of the East Tennessee, Virginia & Georgia Railroad Co. acknowledged the receipt of the communicaion on Sept. 14, and replied that the arrangement was satisfactory to himself. Soon after this time the Assistant General Freight Agent of the East Tennessee, Virginia & Georgia Railroad inquired of the General Freight Agent of the Atlanta & West Point Railroad if bills of lading on cotton from the Atlanta & West Point Railroad to Norfolk and Eastern cities *via* Norfolk would be issued, and received reply that their agents had been instructed to give through bills of lading *via* Georgia and Central railroads only.

It will be observed that the local business of the Western Railroad, of Alabama, and of the Atlanta & West Point Railroad Co. is treated as local business of the Central Railroad Co. and of the Georgia Railroad Co. and is passed as such through Atlanta without division.

The right to do so was neither claimed nor exercised until Sept. 8, 1883, nearly 8 months after the contract was signed, and 3½ months only before its expiration.

In the meantime on April 14, 1883, apportionments had been made by the Board of Arbitration, both at Macon and Atlanta. Divisions had existed for several years along the Western Railroad of Alabama and the Atlanta and West Point Railroad, in which the East Tennessee, Virginia & Georgia Railroad was recognized as entitled to, and did actually receive, its share. These apportionments and divisions constituted a special agreement between the parties in the case, and any infraction of this special agreement is in contravention of the 19th Article of Agreement, which provides as follows :

"All divisions by apportionment of tonnage or revenue shall constitute a special agreement between the companies or lines terminating at or passing through the point at which the apportionment is made, and the terms of such agreements shall be adjusted with reference to the circumstances of each case between the parties, or by arbitration if they cannot agree. The companies to which the allotments are made shall determine the subdivision thereof, and shall be responsible for the settlement of all balances for excess carried by them."

The action instituted by the letter of Sept. 8, 1883, above quoted, withdrew from the pool and from division, business which had previously constituted a part of the pool and joint business, disturbed the apportionments at Atlanta, and destroyed the divisions along the Western Railroad of Alabama, and the Atlanta & West Point Railroad.

While not so designed, this action was, in the opinion of the Arbitrators, violative of the provisions of the 19th Article just quoted. The Vice-President and General Mana-

ger of the East Tennessee, Virginia & Georgia Railroad, under a similar misconception of his rights, commenced a course of action which, in the opinion of the Arbitrators, is contrary to the scope and spirit of the agreement, whose objects, as set forth in preamble and Articles, are in substance to foster harmony and co-operation and mutual protection of interests. If the local business of a company is so far guarded by the Association as to be allowed to pass a competitive and pooled point without division or molestation, for stronger reason and by necessary implication, it follows that it is protected at local stations, which are non-competitive and unpooled points.

The Vice-President and General Manager of the East Tennessee, Virginia & Georgia Railroad shipped the cotton in dispute under the title of "through" cotton, and makes a careful distinction between this and the local cotton stopping at Atlanta. As before stated, this is not recognized as a class by the Articles of Agreement. The classification there is simply "joint" and "local," and the Arbitrators are constrained to place this cotton as local cotton of the Western Railroad, of Alabama, the Atlanta & West Point Railroad, and of the Central and Georgia railroads.

The Arbitrators are thus compelled to consider the action of both the parties as inconsistent with the terms of the agreement of 1883, which goes further to provide a method by which such disagreement, or issues between parties, may be adjusted, namely, "Under the jurisdiction of the Executive Committee over all matters relating to the joint traffic," and in the event of a failure in that body to agree, the "question at issue shall be settled by the Board of Arbitration." If the authorities of the Central and Georgia railroads had, during the pendency of the agreement, come to discover any claim to exclusive control over the business of the Western Railroad of Alabama and the Atlanta & West Point Railroad, that claim should have been the original issue, and should have been accordingly tried and settled by the tribunal appointed by the Association of which they were members. From that decision should have followed the legitimate action of both parties to the issue. This course would have been wholly consistent with the terms of the agreement of 1883, would have precluded the confusion and dangers which have already attended the course arbitrarily adopted independently of the agreement. This issue is not now before the Arbitrators, but other issues springing from it, and with a desire to reinstate the parties to their original conditions before any issue was initiated, and with a view to the harmony and common interest of the parties, as well as of the whole Association, the Arbitrators decide and award as follows:

1. That the letter of the President of the Central Railroad Co. of Georgia, and of the General Manager of the Georgia Railroad Co. be recalled, and that the action thereby instituted be revoked.

2. That all cotton coming from stations on the Western Railroad, of Alabama, and from the Atlanta & West Point, and Georgia and Central Railroads, since Sept. 1, 1883, and passed through Atlanta by the Central Railroad Co. of Georgia, and by the Georgia Railroad Co., without pooling, be now reported for division, as before Sept. 1, 1883.

3. That all cotton shipped by the East Tennessee, Virginia & Georgia Railroad Co. as "through" cotton since Sept. 1, 1883, from local stations on the Western Railroad of Alabama, the Atlanta & West Point Railroad, and on the Central Railroad of Georgia, and the Georgia and the Southwestern Railroads, passed through Atlanta and Macon without pooling, be now reported for division under Macon and Atlanta divisions.

4. That in view of the fact that the business in dispute was done by the East Tennessee, Virginia & Georgia Railroad under a misconception of its rights, only such rates as were obtained by this road, and not full rates, be charged in making up the accounts.

5. That it is the intention of the Board by this ruling to restore the parties in this case to the same relative conditions that existed anterior to Sept. 1, 1883, and to treat and divide the business done since that time to March 1, 1884, as if there had been no interruption of the relations which existed prior to Sept. 1, 1883.

6. While not submitted to the Board in form, yet to carry out the provisions of the above award fairly to the parties in interest, the merchandise business of these roads should be treated and divided as if the relations prior to Sept. 1, 1883, had never been interrupted.

In conclusion, the Board recommends that more exact and definite meanings be given to the terms "joint," "local" and "through" business, so that there may be no possible misconstruction of these terms on the part of members of the Association.

JOHN SCREVEN,
THOS. H. CARTER, } Arbitrators.
E. K. SIBLEY,

Attest: CHAS. A. SINDALL, Secretary.
Atlanta, Ga., Jan 17, 1884.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings will be held as follows:

Boston & Albany, annual meeting, Feb. 11, at 10 a. m., at the Meionaon in Boston.

Boston & Providence, special meeting at the passenger station in Boston, Jan. 31, at 11:30 a. m., to vote on the question of authorizing the directors to take measures for reconstructing the station and enlarging and improving the terminal facilities at Providence, and to issue bonds to provide means for such improvements.

Huntingdon & Broad Top Mountain, annual meeting, at the office in Philadelphia, Feb. 5, at noon.

Philadelphia & Reading, adjourned meeting of stockholders, at the office in Philadelphia, Jan. 28, at noon.

Providence & Worcester, annual meeting, in Providence, R. I., at 10 a. m. on Feb. 4.

Dividends.

Dividends have been declared as follows:

Illinois Central, 4 per cent., semi-annual, and an extra dividend of 2 per cent. for the year, both payable March 1. Transfer books close Feb. 15. With 4 per cent. paid in September last, this makes 10 per cent. for the year 1883.

Pullman's Palace Car Co, 2 per cent., quarterly, payable Feb. 15. Transfer-books close Feb. 1.

Terre Haute & Indianapolis, 4 per cent., semi-annual, payable Feb. 1, to western stockholders at the office of the Treasurer in Terre Haute, Ind.; to eastern stockholders at the office of the Farmers' Loan & Trust Co., No. 20 William street, New York.

Railroad and Technical Conventions.

Meetings and conventions of railroad associations and technical societies will be held as follows:

New England Railroad Club, regular monthly meeting, at the rooms of the Club in the Boston & Albany passenger station in Boston, Wednesday, Jan. 30, at 8 p. m. Car-wheel makers are specially invited to attend. The subject for discussion will be "The Car Wheel of the Future."

Western Association of General Passenger & Ticket Agents, annual meeting, at the Burnet House in Cincinnati, Wednesday, Feb. 13, at 11 a. m. Important business is to be brought before the meeting.

American Institute of Mining Engineers, annual meeting, in Cincinnati, beginning Tuesday evening, Feb. 19. Mr. L. E. Warner, Cincinnati, O., is Chairman of the local Committee of Arrangements. A circular will be hereafter issued giving the details of the meeting.

National Association of General Passenger & Ticket Agents, regular semi-annual meeting, in Cincinnati, O., Tuesday, March 18.

General Time Convention, Spring meeting, at the Grand Hotel in Cincinnati, O., at 11 A. M., on Wednesday, April 9.

Southern Time Convention, Spring meeting, at No. 46 Bond street, New York, at 11 A. M., on Wednesday, April 16.

Railway Car Accountants' Association, annual convention, in Richmond, Va., on Tuesday, May 20.

Mail Service Extensions.

Mail service has been ordered over new railroads or extensions as follows:

Chicago, Milwaukee & St. Paul, service extended over the Southern Minnesota Division from Howard, Dak., to Woonsocket, 40 miles.

Engineers' Club of Philadelphia.

The sixth annual meeting of this club was held at the rooms in Philadelphia, Jan. 12, President Henry G. Morris in the chair; 52 members and 9 visitors present.

The retiring President, Mr. Henry G. Morris, delivered the annual address, in which he ably reviewed the following engineering achievements of the past year:

Canals.—Panama, Isthmus of Corinth, Second Suez, Mersey River to Manchester, Cape Cod, Florida, Bordeaux and Mediterranean, Dublin to Galway, Maryland Penisula and Valley of the Jordan.

Tunnels.—Arlberg, River Severn, British Channel, Boston Sewerage tunnel, Hudson River, and those on the South Pennsylvania Railroad.

Bridges.—East River completed, Niagara Cantilever, Susquehanna, Frith of Forth, Tay.

Railways.—Northern Pacific, Canadian Pacific, Mexican, New York, West Shore & Buffalo, and ship railway across the Isthmus of Tehuantepec, Chicago Railway Exposition, cable propulsion, new telegraphic cables.

Miscellaneous.—Underground electric conduits, electric lighting and improvements in gas lighting, heating by steam in cities, Bartholdi statue, new time standard and marine engineering.

The Secretary and Treasurer's report showed the club to be in a most prosperous condition, with an increased balance of assets and an increase of membership during the year of about 20 per cent.

Mr. Edward I. H. Howell very acceptably occupied the time required to finish the counting of the votes by a description, illustrated by samples, of the manufacture of cold drawn and polished shafting.

The Tellers of Election, Messrs. Codman and Beardsley, announced that 130 votes had been polled and the following officers elected for the year 1884:

President, Col. William Ludlow; Vice-President, J. J. de Kinder; Secretary and Treasurer, Howard Murphy; Directors, T. M. Cleemann, Frederic Graff, Rudolph Hering, Washington Jones and Henry G. Morris.

President Ludlow then spoke as follows:

"I thank you most warmly and sincerely for the honor you have done me in electing me as your President for the year 1884.

"The rank which the club has so rapidly acquired among similar organizations, the character of its membership, and particularly the high reputation of your past presidents, all combine to make the position one of not less honor than responsibility.

"It will be my duty and my pleasure, so far as may be, to maintain and advance the interests of the organization in every way possible, and to use my utmost endeavor not to fall short of the high standard set by those who have preceded me. The status of the engineering profession among the higher agencies of civilization is to-day unquestioned. The engineer is at once the precursor, the concomitant and the mainstay of human progress, and while the world shall continue to go 'down the ringing grooves of change' it is the engineer who must build the grooves, furnish the impetus and lead the way. It remains for us, of this generation, to do our part fearlessly and conscientiously, to make the future better than the present.

"You will not expect much at this time from me in the way of suggestion, but there are one or two points which I desire to present:

"First: To improve the standing of the club, both professionally and socially, here at home, in order that its usefulness to the best interests of the city and state should be developed. The Engineers' Club might well be a recognized organization from which, when occasion arises, both advice and assistance could be sought and rendered to the city of Philadelphia and to the state at large.

"Second: It seems to me that the time must shortly come when the club shall have its permanent abiding place and home, to which all its members could resort, both for study and companionship, and where due provision could be made for its library, reading rooms and general offices. Such a place can readily be found at a moderate increase of rental and in a locality entirely central and convenient.

"I shall confidently look forward to and rely upon the fullest co-operation of all the members in advancing the interests and usefulness of the club during the ensuing year, and again thanking you for the distinguished consideration you have shown me, beg to assure you, collectively and individually, of my sincere regard and appreciation."

The tellers also announced that the amendment to the constitution had been passed by a vote of 174 to 14; 163 votes being the requisite two-thirds of the entire active membership.

Ohio Institute of Mining Engineers.

The winter meeting of the Ohio Institute of Mining Engineers was held in Columbus, O., Jan. 9 and 10. The first session was on the evening of Jan. 9. After satisfactory reports from the Secretary, Mr. Robert S. Paul, of Akron, and the Treasurer, Mr. W. H. Jennings, of Columbus, the reading of the papers was proceeded with. During the sessions of the Institute the following papers were read:

"The Lower Limestone Group Coal Series of Northeastern Ohio," by Charles Whittlesey, of Cleveland; read by Prof. Edward Orton, of Columbus.

"Metals and Their Properties," by Archibald McKillop, of Corning, Mining Engineer of the Ohio Central Railroad Co.; read by W. M. Day, of Cleveland.

"The Social Possibilities of the Miner," by J. G. Chamberlain, of Leetonia.

"The Bedford Cannel Coal," by Edward Orton, Jr., of Columbus.

"Glossary of Technical Mining Terms for Use by Ohio Mining Engineers and Mining Operators," by Andrew Roy, State Mine Inspector and President of the Institute.

"Composition of Ohio Coals," by Prof. Edward Orton.

"Economy of Mining," and "Development of the Jefferson County Coal Field," by William Smurthwaite, of Steubenville.

Besides the above, Mr. R. S. Weitzel, of Logan, exhibited some very fine maps of certain coal mines in the Hocking Valley, and Mr. E. McMillan, of Columbus, gave the results of the chemical analyses of various gas coals.

On the following day officers were elected for the ensuing year. A resolution was adopted directing the Committee on Glossary of Mining Terms to have the same printed, and that a copy be sent to each member of the Institute, with a request to examine and report suggestions to the Secretary, who shall lay such correspondence before the next meeting.

It was resolved to hold the summer meeting in Cleveland in June next.

For the above report we are indebted to the Cleveland *Iron Trade Review*.

ELECTIONS AND APPOINTMENTS.

Bachman Valley.—At the annual meeting in Hanover, Pa., Jan. 14, the following were elected: President, Capt. A. W. Eichelberger; Directors, Henry C. Schriver, Joseph Althoff, Henry A. Young, Stephen Keefer, Josiah W. Gitt, Levi Dubbs, P. R. Pyne, Jerome L. Boyer, A. K. Boyd, Samuel Thomas, Adam Newcomer, Jacob Klinefelter.

Beach Creek, Clearfield & Southwestern.—At the annual meeting in Clearfield, Pa., Jan. 14, the following were chosen: President, Wm. A. Wallace; Vice-President, John G. Reading; Directors, Daniel Beach, Wm. H. Brown, Chauncey M. Depew, Joseph M. Gazzam, W. S. Nearing, S. R. Peale, George H. Platt, L. A. Robertson, James H. Rutter, Cornelius Vanderbilt, Wm. K. Vanderbilt; Secretary, Wm. H. Brown; Treasurer, Cornelius Vanderbilt; Solicitor, S. R. Peale.

Bluffton & Logansport.—The directors of this new company are: Rufus Magee, C. B. Knowlton, J. T. Stevens, A. N. Dukes, Frank Calvert, E. Y. Sturgis, J. W. Tribelet, J. J. Todd, G. E. Gardiner, L. C. Davenport, E. H. Montgomer, L. A. Williamson, William Mutz. Office in Logansport, Indiana.

Bradford, Bordell & Kinzua.—At the annual meeting in Bradford, Pa., Jan. 14, the following were chosen: President, John J. Carter, Directors, L. Emery, Jr., W. W. Brown, A. I. Wilcox, Geo. L. Roberts, R. C. Vilas, R. G. Taylor, B. C. Williams, J. E. Ransom, H. F. Sweetzer, B. W. Spencer; Secretary, J. E. Ransom; Treasurer, B. W. Spencer.

Bradford, Bordell & Smethport.—At the annual meeting in Bradford, Pa., Jan. 14, the following were elected: President, John J. Carter; Directors, L. Emery, Jr., W. W. Brown, A. I. Wilcox, George L. Roberts, R. C. Vilas, R. G. Taylor, B. C. Williams, J. E. Ransom; Secretary, J. E. Ransom; Treasurer, B. W. Spencer.

Bradford & Tiona.—At the annual meeting in Bradford, Pa., Jan. 14, the following were elected: President, Alonzo I. Wilcox, Bradford, Pa. Directors, W. W. Brown, R. E. Whitely, A. F. Allen, Edwin C. Bradley, Bradford, Pa.; T. L. Minier, S. C. Taber, Elmira, N. Y.; John H. Selkreg, Ithaca, N. Y.; A. N. Cole, Wellsville, N. Y.

Bradford, Eldred & Cuba.—At the annual meeting in Bradford, Pa., the following were elected: President, John J. Carter; Directors, L. Emery, Jr., W. W. Brown, A. I. Wilcox, George L. Roberts, R. C. Vilas, R. G. Taylor, B. C. Williams, J. E. Ransom; Secretary, J. E. Ransom; Treasurer, B. W. Spencer.

Bradford & Garfield Air Line.—At the annual meeting in Bradford, Pa., Jan. 14, the following were elected: President, W. W. Brown, Bradford, Pa. Directors, Alonzo I. Wilcox, Richard E. Whitely, E. C. Bradley, Bradford, Pa.; Charles R. Earley, Ridgway, Pa; A. N. Cole, Wellsville, N. Y.; John H. Selkreg, Ithaca, N. Y.; T. L. Minier, S. C. Taber, Elmira, N. Y.

Brunswick & Western.—At the annual meeting in Brunswick, Ga., Jan. 15, the following directors were chosen: Charles L. Schlatter, Brunswick, Ga.; I. E. Welch, Albany, Ga.; A. E. Bamberger, Henry Budge, C. P. Goodyear, Frederick Wolffe, Z. Zabriskie, New York.

Buena Vista.—Judge J. M. Lowe, of Buena Vista, Ga., has been chosen President of this company, and W. D. Murray Treasurer.

Buffalo, New York & Philadelphia.—The board has re-elected C. H. Allen Vice-President; R. Trimble Secretary; F. S. Buell Treasurer.

Canadian Pacific.—Mr. W. Sutherland Taylor has been chosen Treasurer of this company. He has been for a long time Secretary of the Toronto, Grey & Bruce.

Central Railroad & Banking Co., of Georgia.—At the annual meeting in Savannah, Ga., Jan. 7, the old board was re-elected as follows: W. G. Raoul, Jacob Rauers, W. W. Gordon, George J. Mills, Abram Minis, J. J. Gresham, E. H. Green, John M. Guerard, George Cornwall, William Hunter, H. M. Comer, S. M. Inman, R. B. Reppard.

Champlain Transportation Co.—At the annual meeting in Burlington, Vt., Jan. 9, this company elected the following officers: President, LeGrand B. Cannon; Vice-President, I. V. Baker; Treasurer, Vernon P. Noyes; Directors: LeGrand B. Cannon, I. V. Baker, George B. Chase, A. L. Inman, R. S. Taft, Vernon P. Noyes, H. L. G. Cannon; Executive Committee, Col. Cannon, Mr. Baker, Mr. Noyes; Superintendent, P. W. Barney; Chief Engineer, James Denham.

Chartiers & Youghiogheny.—At the annual meeting in Pittsburgh, Jan. 14, the following were chosen: President, J. E. Schwartz; Directors, Jacob Henrici, Henry Hice, E. Gregg, O. P. Scaife, John Reeves, Roger Hartley, John G. McConnell, J. H. Furguson, Thomas MacConnell, Robert Wardroy.

Chicago, Springfield & St. Louis.—This company has elected John A. Hunter President; A. H. Stonebraker, Vice-President; H. H. Beach, Treasurer; James H. Atterbury, Secretary.

Chicago Union Stock Yards & Transit Co.—At a meeting held in Chicago, Jan. 19, the following officers were re-elected: President, Nathaniel Thayer, Boston; Vice-President, John B. Sherman; Secretary and Treasurer, George T. Williams; Assistant Secretary and Treasurer, J. T. Dennison; Superintendent, George Titus.

Cincinnati, Hocking Valley & Huntington.—At the annual meeting in Chillicothe, O., Jan. 14, the following directors were chosen: Marcus Boggs, John D. Madeira, John C. Entrekin, Chillicothe; John Carschner, Adelphia, O.; Charles Smith, Chauncey, O.; J. W. B. Sprague, Bainbridge, O.; H. C. Dawson, William H. Gregg, Hillsboro, O.; Henry T. Niles, Toledo, Ohio.

Cincinnati Railway Club.—This club has elected the following officers: President, Orland Smith; Vice-President, David Edwards; Secretary, Albert Caffee; Treasurer, J. H. Magill.

Cincinnati, Van Wert & Michigan.—At the annual meeting in Van Wert, O., Jan. 7, the following directors were chosen: Grinnell Burt, Titus Sheard, W. H. Shelden, George M. Olcott, Henry Coffin, New York; A. V. Rice, J. M. C. Marble, H. Butler, Everett Garrison, Henry Van Tilburg, J. P. Gasser, L. L. Bell, E. C. Dawes, Ohio; J. M. Pendleton, Rhode Island; Richard Smith, New Jersey. The board organized by electing Grinnel Burt President; J. M. C. Marble, Vice-President; D. B. Halstead Secretary and Treasurer.

Cleveland, Columbus, Cincinnati & Indianapolis.—Mr. Wm. Garsting has been appointed Master Mechanic of the Columbus Division, with office at Cleveland, O., in place of Mr. W. L. Gilmore, who has gone to the Lake Shore road.

Colebrookdale.—At the annual meeting in Philadelphia, Jan. 21, the following were elected: President, Joseph L. Bailey; Directors, J. Lowrie Bell, D. B. Boyer, W. A. Church, Albert Foster, Nicholas Johnson, I. V. Williamson. The road is leased to the Philadelphia & Reading.

Connecticut River.—At the annual meeting in Springfield, Jan. 16, the following directors were chosen: Frederick Billings, Woodstock, Vt.; Wm. R. Cone, Hartford, Conn.; Augustus T. Perkins, Barnstable, Mass.; Charles S. Sargent, Brookline, Mass.; Oscar Edwards, Northampton, Mass.; Wm. B. Washburn, Greenfield, Mass.; Wm. Whiting, Holyoke, Mass.; A. B. Harris, N. A. Leonard, Springfield, Mass. This is the old board.

Connotton Valley.—Mr. Samuel Briggs has been appointed Reciver in a suit for foreclosure begun by the New England Trust Co. in the Court of Common Pleas at Massillon, Ohio.

Coudersport & Port Allegheny.—At the annual meeting in Coudersport, Pa., Jan. 14, the following were elected: President, F. W. Knox; Directors, F. H. Arnold, Isaac Benson, C. V. B. Barse, C. S. Carey, B. D. Hamlin, W. K. Jones, A. G. Olmstead, F. H. Root; Secretary, A. B. Mann; Treasurer, M. W. Barse; Superintendent, B. A. McClure.

Engineers' Club of Philadelphia.—At the annual meeting in Philadelphia, Jan. 12, the following officers were chosen: President, Col. Wm. Ludlow; Vice-President, J. J. de Kinder; Secretary and Treasurer, Howard Murphy; Directors—T. M. Cleeman, Frederick Graff, Rudolph Hering, Washington Jones, Henry G. Morris.

Fort Wayne & Jackson.—At the annual meeting in Jackson, Mich., Jan. 15, the following directors were chosen: Samuel Sloan, Percy R. Payne, Rosewell G. Rolston, Stephen S Palmer, Lawrence Turnure, Henry Best, Frank Munce, William S. Sloan, Amos Root, Dwight Merriman, James F. Joy. The directors afterwards met and elected the following officers: President, Samuel Sloan; Secretary, R. G. Rolston, of New York. The road is leased to the Lake Shore & Michigan Southern.

Florida Central & Western.—President B. S. Henning announces that Mr. W. M. Davidson having resigned his position as General Manager, Mr. D. E. Maxwell is appointed to take charge of the property as General Superintendent. General Superintendent Maxwell has issued the following, dated Fernandina, Fla., Jan. 1, 1884: "In assuming the management of the Florida Central & Western Railroad, I beg to announce that the traffic department of the company has been consolidated with that of the Florida Transit & Peninsular, and that Mr. F. B Papy, General Freight Agent, and Mr. A. O. MacDonnell, General Passenger and Ticket agent of the Transit system, will assume the duties of their respective offices of this road. All communications relating to the business of their departments should be addressed to them at Fernandina, Fla. Mr. T. W. Roby will continue as Auditor and Cashier, with office at Jacksonville, where all communications pertaining to these departments should be addressed."

Galveston, Houston & Henderson.—At the annual meeting in Galveston, Tex., last week, the following directors were elected: Jay Gould, Russell Sage, W. D. Ballinger, W. A. Harding, F. A. Rice, J. A. Baker, W. H. Newman. The board afterward met and elected the following officers: W. H. Harding, President; W. H. Newman, Vice-President; D. S. H. Smith, Secretary and Treasurer.

Galveston, Sabine & St. Louis.—At the annual meeting in Longview, Tex., Jan. 15, the old directors were re-elected, and subsequently chose John Durand President; Brad Barrer, Vice-President and General Manager; S. H. Easton, Secretary; Samuel Cundiff, Treasurer; Peter Vanderwater, Assistant Treasurer.

Garfield & Tionesta.—At the annual meeting in Bradford, Pa., Jan. 14, the following were chasen: President, George L. Roberts, Bradford, Pa. Directors, Edwin C. Bradley, R. E. Whitely, A. I. Wilcox, Bradford, Pa.; Henry Baxter, Galen, Pa.; J. B. Bradley, Bolivar, N. Y.; A. N. Cole, Wellsville, N. Y.; John H. Selkreg, Ithaca, N. Y.; T. L. Minier, Elmira, N. Y.

Gold & Driftwood.—At the annual meeting in Bradford, Pa., Jan. 14, the following were elected: President, Chas. R. Earley, Ridgway, Pa.; Directors, J. H. Cochran, Driftwood, Pa.; Joseph Cochran, Emporium, Pa.; Geo. R. Woodward, J. H. Hagerty, Ridgway, Pa.; A. N. Cole, Wellsville, N. Y.; T. H. Minier, Elmira, N. Y.; J. H. Selkreg, Ithaca, N. Y.; A. J. Applebee, Wellsville, N. Y.

Gulf, Colorado & Santa Fe.—A Galveston dispatch says that President George Sealy will shortly resign and will be succeeded by Mr. John Sealy, now General Manager. Mr. Webster Snyder, well known from his connection with the Union Pacific, the Canada Southern and other roads, has been chosen General Manager.

Hoosac Tunnel Dispatch.—Mr. Wm. F. Everest has been appointed Manager of the new fast freight line, with office in Buffalo, N. Y. Mr. Everest was recently assistant manager of the Great Eastern Line.

Illinois & St. Louis.—At the annual meeting in Belleville, Ill., last week, the following directors were chosen: Jos. W. Branch, Adolphus Meier, John D. Perry, C. S. Greeley, Hugh Campbell, Thos. McKissock, Wm. A. Hargadine, Russell Hinckley, B. F. Switzer, G. A. Koerner, Jefferson Rainey, J. B. Rentchler, A. C. Hucke, Thomas Winstanley, E. H. Wangelin. Subsequently the board met and organized by electing Jos. W. Branch, President; Thomas McKissock, Vice-President; P. T. Burke, Secretary and Treasurer; C. H. Sharman, General Superintendent.

Lake Shore & Michigan Southern.—The title of Mr. George W. Stevens, who succeeded Mr. James Sedgley, as heretofore noted, is Superintendent of Motive Power. The office of General Master Mechanic is abolished, its authority and duties being transferred to the Superintendent of Motive Power.

Louisville & Nashville.—Mr. O. M. Dunn is appointed Superintendent of the New Orleans & Mobile Division, appointment to take effect Jan. 15, 1884. Office in New Orleans.

Louisville, New Albany & Chicago.—The board has elected Mr. James Roosevelt, of Hyde Park, N. Y., President in place of Bennett H. Young, resigned. The office of Second Vice-President, vacated by the resignation of Mr. E. B. Stahlman, was not filled.

Maryland Central.—At the annual meeting in Baltimore, Jan. 21, the following directors were chosen: Thomas Armstrong, John M. Denison, Wm. Gilmore, Charles W. Hatter, Foulk Jones, Henry R. McNally, Caleb J. Moore, James P. Streett, Joseph M. Streett, Caleb S. Taylor, Eli Tucker, Wm. H. Waters, Granville O. Wilson.

Michigan & Ohio.—Mr. J. D. Barnes has been appointed Chief Engineer, with office in Toledo, O. He was recently Division Engineer on the Rochester & Pittsburgh road.

Missisquoi & Clyde Rivers.—At the annual meeting in Newport, Vt., last week, W. G. Elkins, H. C. Wilson, Dr. J. H. Hamilton, J. W. Currier and O. N. Elkins were elected directors, and subsequently, W. G. Elkins was chosen President, and Col. Elkins Secretary and Treasurer.

New Castle & Southern.—At the annual meeting, Jan. 14, the following were chosen: President, James S. Negley; Directors, Thomas P. Simpson, New York; H. D. Wallace, Geo. B. Burger, O. H. F. Green, New Castle; C. T. Allen, Wampum; C. D. Clark, Jersey City; Gen. J. S. Robinson, Kenton, O.; H. P. Hanna, Richard Nevins, Jr., H. E. Collins, R. C. Patterson, John M. Berlin, Pittsburgh.

New Castle & Western.—At the annual meeting in Pittsburgh, Jan. 14, the following were elected: President, James S. Negley; Directors, Thomas P. Simpson, Samuel K. Schwenk, New York; Gen. J. S. Robinson, Kenton, O.; J. S. Negley, Jr., H. T. Hanna, Chas. F. Calhoun, R. C. Patterson, Pittsburgh.

New England General Passenger & Ticket Agents' Association.—At the annual meeting in Boston, Jan. 16, the following officers of the Association were elected: F. L. Pomeroy, Ogdensburg & Lake Champlain, President; W. F. Simons, Northern (N. H.), Vice President; J. H. Carpenter, Boston, Concord & Montreal, Secretary.

New Orleans & Northeastern.—At the annual meeting in New Orleans, Jan. 21, the following directors were chosen: H. Abraham, E. L. Carriere, W. A. Goodman, Alexander McDonald, Robert Mott, J. H. Oglesby, Otto Plock, John Scott, A. Wessell. The Board elected John Scott President and General Manager; Alexander McDonald Vice-President; O. T. Ambrose Secretary; F. Hahn Treasurer.

New York Central & Hudson River.—Mr. John W. Horan has been appointed Auditor of Freight Accounts of this company, to fill the vacancy caused by the death of Mr. John F. Desmazes; and Mr. George E. Adams has been appointed Assistant Auditor of Freight Accounts in place of Mr. John W. Horan, promoted.

New York, New Haven & Hartford.—The new board has elected George H. Watrous, President; E. M. Reed, Vice-President and General Manager; Wm. D. Bishop, Jr., Secretary; Wm. L. Squire, Treasurer. The office of Second Vice-President, lately held by Mr. Charles P. Clark, was not filled.

New York, Ontario & Western.—The new board has elected E. F. Winslow President; Theodore F. Houston Vice-President; John L. Nisbet Secretary and Treasurer. Mr. Nisbet, previously Assistant Treasurer, succeeds Conrad N. Jordan. The board also elected Wm. M. Long a director in place of Thomas C. Clarke, declined to serve.

Norwich & New York Transportation Co.—Mr. George W. Brady is appointed Agent in New York in place of Mr. W. H. Turner, who has gone to the New York & New England road.

Northern Pacific.—At a meeting of the board in New York, Jan. 17, the committee appointed to nominate a president made a report recommending Mr. Robert Harris for that office. The report was accepted, and Mr. Harris was unanimously elected President.

Mr. Harris was before the war Superintendent of the Galveston, Houston & Henderson road. He served in the army during the war with credit, and afterward became Superintendent of the Western Union road. Thence he went to the Chicago, Burlington & Quincy, where he served successively as Assistant Superintendent, General Superintendent and President, gaining a wide reputation as a successful manager. For several years past he has been Vice-President of the New York, Lake Erie & Western.

Ohio Institute of Mining Engineers.—At the annual meeting in Columbus, O., Jan. 9, the following officers were elected for the ensuing year: President, Andrew Roy, Columbus; Vice-President, E. D. Shreve, Wooster; Secretary, Edward Orton, Jr., Columbus; Treasurer, W. H. Jennings, Columbus.

Old Colony.—Mr. Berkeley Powell has been appointed Master Mechanic of the Northern Division. He has been for some time Master Mechanic of the California Southern road.

Oley Valley & Lehigh.—At the annual meeting in Reading, Pa., Jan. 14, the following were chosen: President, George Brooke; Directors, Israel M. Bertolet, John B. Bertolet, Hiram Y. Kaufman, John O. Keim, George K. Lerah, George D. Stitzel; Secretary and Treasurer, R. B. Kinsey.

Philadelphia & Reading Coal & Iron Co.—Mr. John Veith has been appointed General Superintendent of all collieries under the control of the company. These collieries are now arranged in three divisions, as follows: Southern Division, including all collieries south of Broad Mountain, Thomas Doyle, Pottsville, Pa., Superintendent; Eastern Division, including all collieries north of Broad Mountain and east of Ashland, J. L. Williams, Superintendent, Shenandoah, Pa.; Western Division, including all collieries north of Broad Mountain and west of the Girard District, Wm. Booth, Shamokin, Pa., Superintendent.

Pine Creek.—At the annual meeting of this company (late the Jersey Shore, Pine Creek & Buffalo), the following were elected: President, Henry Sherwood; Directors, John W. Bailey, Jefferson Harrison, Anton Hardt, Wm. Howell, Jr., George J. Magee, Jerome B. Niles, Augustus Schell, E. G. Schieffelin, Walter Sherwood, Cornelius Vanderbilt, Wm. H. Vanderbilt, Wm. K. Vanderbilt.

Pine Creek & Tioga Valley.—At the annual meeting in Bradford, Pa., Jan. 14, the following were elected: President, William Dent, Brookland, Pa.; Directors, Thomas J. Hull, Miles Dykeman, Brookland, Pa.; C. R. Earley, Ridgway, Pa.; J. Henry Cochran, Driftwood, Pa.; T. L. Minier, S. C. Taber, Elmira, N. Y.; J. H. Selkreg, Ithaca, N. Y.; A. N. Cole, Wellsville, N. Y.

Pittsburgh, Fort Wayne & Chicago.—At a meeting of the board of directors held Jan. 18, Mr. William Hooper, of Cincinnati, O., was elected to fill the unexpired term of Mr. Amasa Stone, of Cleveland, O., deceased, and Mr. L. Z. Leiter, formerly of Field, Leiter & Co., Chicago, to succeed the late Mr. Pliny Hoagland, of Fort Wayne, Ind. Mr. Louis H. Meyer was re-elected President, and John J. Haley Secretary and Treasurer.

Pittsburgh, Chartiers & Youghiogheny.—At the annual meeting in Pittsburgh, Jan. 14, the following were elected: President, J. E. Schwartz; Directors, Jacob Henrici, Henry Hice, John Reeves, Roger Whartler, B. F. Wilson, Edward Gregg, E. H. Howe, O. P. Scaife, John G. MacConnell, Wm. A. Robinson, Wm. Miller.

Reno City & Eldred.—At the annual meeting in Bradford, Pa., Jan. 14, the following were chosen: President, John J. Carter; Directors, L. Emery, Jr., W. W. Brown, A. I. Wilcox, George L. Roberts, R. C. Vilas, R. G. Taylor, B. C. Williams, J. E. Ransom; Secretary, J. E. Ransom; Treasurer, B. W. Spencer.

Sharpsville.—At the annual meeting in Sharpsville, Pa., Jan. 14, the following were elected: President, Walter Pierce; Directors, J. J. Pierce, James B. Pierce, Wallace Pierce, James Dexter, M. H. Taylor, Wm. L. Scott. The board elected Walter Pierce General Manager; Frank Pierce, Vice-President.

Sinnemahoning & Pine Creek.—At the annual meeting in Bradford, Pa., Jan. 14, the following were elected: President, Charles R. Earley, Ridgway, Pa. Directors, J. Henry Cochran, Driftwood, Pa.; Joseph Cochran, Emporium, Pa; O. B. Grant, George R. Woodward, Ridgway, Pa.; A. N. Cole, A. J. Applebee, Rufus Scott, Wellsville, N. Y.; T. L. Minier, Elmira, N. Y.

Sinnemahoning & Sheffield.—At the annual meeting in Bradford, Pa., Jan. 14, the following were elected: President, Charles R Earley, Ridgway, Pa.; Directors, J. Henry Cochran, Driftwood, Pa.; Jos. Cochran, Emporium, Pa.; O. B. Grant, Geo. R. Woodward, Ridgway, Pa.; A. J. Applebee, A. N. Cole, Wellsville, N. Y.; T. L. Minier, Elmira, N. Y.; J. H. Selkreg, Ithaca, N. Y.

State Line, Brookland & Pine Creek.—At the annual meeting in Bradford, Pa., Jan 14, the following were elected: President, William Dent, Brookland, Pa.; Directors, Thos. G. Hull, Brookland, Pa.; C. R. Earley, Ridgway, Pa.; J. Henry Cochran, Driftwood, Pa.; George H. Blackman, Belmont, N. Y.; Rufus Scott, Henry N. Lewis, A. N. Cole, Wellsville, N. Y.

St. Paul & Eastern Grand Trunk.—At the annual meeting in Milwaukee, Jan. 11, the following directors were chosen: Thad. C. Pound, L. C. Stanley, George C. Ginty, Chippewa Falls, Wis.; Wm. Wilson, Menominee, Wis.; C. M. Upham, M. Wescott, Shawano, Wis.; George Beyer, O. A. Ellis, W. H. Young, Oconto, Wis.; Dana C. Lamb, Fond du Lac, Wis.; George L. Shoup, Salmon City, Idaho; A. J. Whiteman, Dansville, N. Y.; N. L. Linsley, New York.

Susquehanna, Pittsburgh & Western.—At the annual meeting in Pittsburgh, Jan. 14, the following were chosen: President, James S. Negley, Pittsburgh. Directors, Thomas P. Simpson, New York; James S. Negley, H. T. Hanna, Charles F. Calhoun, H. E. Collins, Richard Nevins, Jr., Pittsburgh; C. D. Clark, Jersey City, N. J.; J. S. Robinson, Kenton, O.

Terre Haute & Indianapolis.—At the annual meeting in Terre Haute, Ind., Jan. 7, the following directors were elected: W. R. McKeen, Alexander McGregor, Delos W. Miashall, Henry Ross, Josephus Collett, F. C. Crawford, George E. Farrington. The board elected the following officers: W. R. McKeen, President; George E. Farrington, Secretary; J. W. Cruft, Treasurer.

Terre Haute & Logansport.—This company, which is owned by the Terre Haute & Indianapolis Co., has elected W. R. McKeen President; George E. Farrington Secretary and Treasurer.

Union Pacific.—Mr. W. F. Herman has been appointed Traveling Agent, with headquarters in Cleveland, O. Mr. R. P. Rollins has been appointed Traveling Agent, with headquarters in Chicago.

Utica, Clinton & Binghamton.—At the annual meeting in Utica, N. Y., Jan. 21, the following directors were chosen: George B. Phelps, Isaac Maynard, R. S. Williams, John Thorn, W. M. Storrs, G. W. Adams, Frank D. Beebe, A. N. Sheldon, Allen Curtis, John W. Lippitt, Allen W. Reynolds, William S. Bartlett, James I. Scollard. The board elected Isaac Maynard President; George B. Phelps Vice President; Robert S. Williams, Secretary and Treasurer.

Waynesburg & Washington.—At the annual meeting in Waynesburg, Pa., Jan. 14, Mr. J. F. Temple was re-elected President and C. E. Bowers Superintendent, with the old board of directors.

Western & Atlantic.—Mr. James Maloy has been appointed Passenger Agent of this company, with headquarters at Atlanta, Ga.; to date from Jan. 15.

Youghiogheny Northern.—At the annual meeting in Pittsburgh, Jan. 14, the following directors were chosen: Thomas Mellon, H. C. Frick, E. M. Ferguson, Walton Ferguson, John Walker, Thomas M. Carnegie, George Lauder. The board organized with the following officers: Thomas Mellon, President; A. M. Thorne, Treasurer; A. F. McCook, Secretary.

Zanesville, McConnellsville & Pomeroy.—At a meeting held in Zanesville, O., Jan. 7, the following directors were elected: George M. Jewett, Albert W. Train, Albert E. Boone, William S. Harken, James Buckingham, William H. Johnson, Perry Wiles, Thomas C. Griffith, Norris C. Harken, John W. Pinkerton, William A. Graham, George Z. Dickerson, Charles E. Andrews. The directors immediately organized by electing as officers: President and General Manager, Albert E. Boone; Vice President, George M. Jewett; Secretary, W. S. Harken; Treasurer, Charles E. Andrews.

PERSONAL.

—Mr. Bennett J. Young, President of the Louisville, New Albany & Chicago Co., has resigned his position.

—Mr. George Revett has resigned his position as General Superintendent of the South Pacific Coast Railroad.

—A Galveston dispatch says that Mr. George Sealey has resigned his position as President of the Gulf, Colorado & Santa Fe Co., to date from March 1 next.

—Mr. E. B. Stahlman has resigned his position as Second Vice-President of the Louisville, New Albany & Chicago Co., on account, it is said of dissension in the management.

—Mr. Briggs S. Cunningham has resigned his position as President of the Kentucky Central Railroad Co. A meeting of the board was to be held this week to choose his successor.

—Mr. Charles Handy Russell, for many years a prominent merchant of New York, died in that city Jan 21, aged 88 years. He was for several years Vice-President of the Chamber of Commerce and was one of the oldest members of that body. He was for several years a director of the Boston & Providence Co. and was one of the incorporators

of the Hudson River Railroad Co., serving as a director of that company until it was consolidated with the New York Central. Mr. Russell retired from active business several years ago.

—Mr. Wm. G. Swan died in Milwaukee, Wis., Jan. 17, aged 42 years. Though still a young man Mr. Swan had had a wide experience in railroad business. He served for several years on the Chicago, Milwaukee & St. Paul, and was for a time Assistant General Freight Agent. He was afterward General Eastern Agent of the Chicago & Northwestern and for some time General Superintendent of the old West Wisconsin road. In 1877 he returned to the Chicago, Millwaukee & St. Paul as General Freight Agent, and in 1880 was made Superintendent of Freight Traffic, which office he held until last October, when he resigned on account of ill-health.

—In one of Emerson's letters to Carlyle (page 337 of Vol. II. of the Correspondence of Thomas Carlyle and Ralph Waldo Emerson) is the following concerning a late President of the Chicago, Burlington & Quincy Railroad Co. Emerson had been speaking of his "near neighbors, topographically and practically." Having mentioned E. Rockwood Hoar, then recently Attorney-General (the letter was written in 1870), he says: "Another is John M. Forbes, a strictly private citizen, of great executive ability, and noblest affections, a motive power and regulator essential to our city—refusing all office, but impossible to spare; and these are men whom to name the voice breaks and the eye is wet." A son of Mr. Forbes married one of Emerson's daughters.

—The Bedford (Pa.) *Gazette* of Feb. 11 says: "William Clark—familarly known as 'Pap' Clark—for 20 years express messenger and baggage-master on the Huntingdon & Broad Top Railroad, has resigned his position and will go into business in Huntingdon. On Saturday he passed over the line from Huntingdon to Cumberland and said farewell to his friends. All were sorry to see the old man go and many were the wishes expressed for his future welfare. Mr. Clark was for 16 years in the service of the Philadelphia & Reading Railroad Co. and for 20 years in the service of the Huntingdon & Broad Top, and during that time he travelled 1,296,000 miles. He is now 72 years old. May he travel down life's decline as slowly as a freight train moves over the Dutch Corner Branch, and may he pass into the next world on a first-class ticket and with his baggage checked through to the happy hunting ground."

TRAFFIC AND EARNINGS.

Railroad Earnings.

Earnings for various periods are reported as follows:

	1883.	1882.	Inc. or Dec.		P. c.
Year ending Dec. 31:					
Ala. Gt. Southern	$1,059,174	$856,752	I.	$202,422	23.7
C., N. O. & T. P..	2,587,264	2,567,135	I.	20,129	0.8
Col. & Greenville	737,920	799,156	D.	61,236	7.7
F. Transit & Pen.	535,220	428,774	I.	106,446	24.8
Marq., H. & O ...	903,179	1,193,987	D.	290,808	24.4
N., C. & St. L ...	2,328,893	2,162,857	I.	166,036	7.7
Net earnings...	1,058,290	940,455	I.	117,835	12.5
Pennsylvania. ...	51,083,051	49,079,633	I.	2,003,418	4.1
Net earnings....	19,336,102	18,432,429	I.	903,673	4.9
St. L. & Cairo ...	385,630	379,441	I.	6,189	1.6
Vicks & Meridian	529,501	482,240	I.	47,261	9.8
Ten months ending Oct. 31:					
N. Y., L. E. & W.	$19,884,155	$16,693,241	I.	$3,190,914	19.1
Five months, July 1-Nov. 30:					
C. & Gd. Trunk..	£270,907	£210,240	I.	£60,667	28.9
Net earnings...	72,322	56,829	I.	15,493	27.2
D., Gd. H. & Mil.	130,144	127,466	I.	2,678	2.1
Net earnings...	42,658	39,877	I.	3,081	7.7
Grand Trunk	1,603,196	1,535,225	I.	67,971	4.4
Net earnings. .	522,980	478,178	I.	44,802	9.4
Month of October:					
N. Y., L. E. & W.	$2,411,146	$1,819,010	I.	$592,136	32.6
Net earnings...	843,368	643,329	I.	200,039	31.1
Month of December:					
Ala. Gt. Southern.	$106,782	$94,779	I.	$12,003	12.6
C., N. O. & T. P..	223,517	208,814	I.	14,703	7.0
F. Transit & Pen.	64,654	51,964	I.	12,690	24.8
Marq., H. & O....	21,127	19,561	I.	1,566	7.3
Nash., C. & St. L.	209,999	210,675	D.	676	0.1
Net earnings...	94,171	103,371	D.	9,200	8.9
Pennsylvania.....	3,840,579	4,157,238	D.	316,659	7.7
Net earnings. ..	1,183,287	1,184,912	D.	1,625	0.4
St. L. & Cairo ...	25,243	33,978	D.	8,735	25.1
Vicks. & Meridian	66,334	67,735	D.	1,401	2.6
First week in January:					
	1884.	1883.			
Chi. & West. M....	$17,529	$21,620	D.	$4,091	18.9
C. Wash. & Balt.	31,347	30,618	I.	729	2.4
Cleve., Ak. & Col.	7,052	8,996	D.	1,944	21.6
Des M. & Ft. D....	4,870	5,247	D.	377	7.2
G. B., W. & St. P.	5,319	7,004	D.	1,685	24.1
Kentucky Central	8,974	10,490	D.	1,516	14.5
Lake E. & West	15,038	26,550	D.	11,512	42.6
Ohio Central.....	14,703	20,082	D.	5,379	26.9
St. L., Alt. & T. H.:					
Main Line	21,237	27,810	D.	6,577	23.6
Belleville Line.	10,980	14,203	D.	3,223	22.7
Second week in January:					
Bur., Cedar Rap. & Northern....	$46,720	$44,302	I.	$2,418	5.4
Canadian Pacific	63,000	39,000	I.	24,000	61.5
Chi. & Eastern Ill.	33,306	31,052	I.	2,254	7.3
Chi. & Gd. Trunk	42,055	52,329	D.	10,274	19.7
Chi., M. & St. P..	346,000	307,796	I.	38,204	12.4
Chi. & Northwest.	317,700	303,400	I.	14 300	4.7
C., St. P., M. & O.	81,200	72,100	I.	9,100	12.6
Denver & R. G....	115,400	103,700	I.	11,700	11.3
Det., Lan & No..	19,836	24,175	D.	4,339	18.1
Ill. Central.....	251,300	253,553	D.	2,253	0.9
Ind., Bloom. & W.	51,091	51,314	D.	223	0.4
Long Island	34,014	30,261	I.	3,753	12.5
Louis. & Nash....	207,000	245,840	D.	38,840	15.8
Peoria, D. & Ev.	16,699	10,199	I.	6,500	63.7
Rochester & Pitts.	10,673	5,811	I.	4,862	83.7
St. L. & San Fran	66,600	61,725	I.	4,875	8.0
St. P. & Duluth..	16,722	15,880	I.	842	5.3
St. P., M. & Man.	98,480	128,380	D.	29,900	23.3

Weekly reports of earnings are usually estimated in part, and are subject to correction by later statements.

Grain Movement.

For the week ending Jan. 12 receipts and shipments of grain of all kinds at the eight reporting Northwestern markets and receipts at the seven Atlantic ports have been, in bushels, for the last 8 years:

Year.	Northwestern receipts.	Northwestern shipments.	Atlantic receipts.
1877.....	1,632,416	638,319	1,217,472
1878.....	4,158,086	1,797,607	3,275,956
1879.....	3,123,153	1,417,268	2,394,162
1880.....	4,739,454	1,157,345	2,575,622
1881.....	2,890,312	1,955,339	1,880,419
1882.....	4,252,751	2,479,443	1,526,037
1883.....	3,974,668	3,001,040	3,058,404
1884.....	3,594,433	2,173,901	951,628

Thus the receipts of the Northwestern markets for the week this year were 380,000 bushels less than last year, but were exceeded in only three of the eight years. They were 582,000 bushels *less* than in the previous week of this year and the smallest since July last.

The shipments of those markets were 827,000 bushels less than in the corresponding week of last year, and 305,000 less than in 1882, but larger than in any earlier year. They were 517,000 bushels (31 per cent.) *more* than in the previous week of this year, which, perhaps, may be ascribed to the reduction from 30 to 20 cents in the rate charged by the railroads; but with the exception of the two weeks next preceding, they were the smallest since May, 1882. No shipments down the Mississippi are reported.

The receipts at the Atlantic ports for the week were much smaller than in the corresponding week of any previous year, and not one-third what they were last year or in 1878. There were 422,000 bushels less than in the previous week of this year, 1,275,000 less than the average weekly shipments in December, and the smallest reported in any week in a record covering every week since 1875. The receipts are extremely small at all the ports.

The exports from Atlantic ports for the *two* weeks ending Jan. 12 have been for five years:

	1880.	1881.	1882.	1883.	1884.
Flour, bbls.	208,534	387,044	164,351	434,555	344,508
Grain, bu..	4,159,734	3,422,513	2,100,126	4,708,640	2,415,080

Thus the exports this year are much smaller than in any other of the five except last year.

Coal.

Coal tonnages for the week ending Jan. 12 are reported as follows:

	1884.	1883.	Inc. or Dec.		P. c.
Anthracite	308,701	570,084	D.	261,383	45.9
Eastern bituminous	138,002	162,467	D.	24,465	15.1
Coke.....	48,140	72,912	D.	24,772	34.0

The anthracite comparison is with a short-time week this year. Shipments from collieries were somewhat delayed by snow also, but there is a sufficient stock at tidewater to supply the trade.

The bituminous trade is very quiet and shipments are light. They will probably continue light for some weeks to come.

Chicago coal receipts for the eight months from May 1 to Dec. 31 are reported as follows:

	Anthracite.		Bituminous.	
	1883.	1882.	1883.	1882.
By lake...	748,467	629,385	210,860	274,908
By rail....	392,204	325,199	1,668,391	1,703,617
Total 1,140,671		954,584	1,879,251	1,978,525
Per cent by rail...	34.3	34.1	88.8	86.1

The total increase in anthracite was 186,087 tons, or 19.5 per cent., the lake and rail receipts increasing in very nearly the same proportion. The decrease in bituminous coal was 99,274 tons, or 5.3 per cent. The total receipts of all kinds were: 1883, 3,019,922; 1882, 2,933,109; increase, 86,813 tons, or 2.9 per cent.

The coal tonnage of the Pennsylvania Railroad for the week ending Jan. 12 was as follows:

	Coal.	Coke.	Total
Line of road 116,771		43,938	160,709
From other lines	43,492	4,202	47,694
Total.....	160,263	48,140	208,403

The total tonnage this year to Jan. 12 was 407,762 tons, against 457,058 tons to the corresponding date last year, a decrease of 49,296 tons, or 10.8 per cent.

Mr. Andrew Roy, State Inspector of Mines of Ohio, estimates the total coal production of that state for 1883 at 8,229,429 tons, a decrease of nearly 1,000,000 tons, or 11 per cent., from 1882. The decrease was in the Tuscarawas Valley, the Steubenville and the Coshocton districts, while the Hocking Valley, the Jackson County and the Cambridge districts showed an increase.

Cumberland coal shipments for the week ending Jan. 19 were 82,467 tons. The total shipments this year to Jan. 19 were 82,528 tons, against 102,501 tons to the corresponding date last year, a decrease of 19,973 tons, or 19.5 per cent.

Anthracite coal tonnage for the month of December is shown as follows by the report of Mr. John H. Jones, the Official Accountant, the statement including the entire production of anthracite coal, excepting that consumed by employés, and for steam and heating purposes about the mines:

	1883.	1882.	Inc. or Dec.		P. c.
Phila. & Reading } Central of N. J... }	754,918	644,423 / 348,340	D.	237,854	23.9
Lehigh Valley	422,571	524,932	D.	102,361	19.5
Del., Lack. & West..	370,704	408,650	D.	37,946	9.3
Del. & Hud. C. Co....	223,995	296,320	D.	72,325	24.4
Pennsylvania R. R....	215,794	163,373	I.	52,421	32.2
Penna. Coal Co.....	108,975	125,276	D.	16,301	13.0
N. Y., L. E. & W.....	36,290	88,117	D.	51,827	58.9
Total.....	2,133,247	2,599,440	D.	466,193	17.9

New Jersey Central tonnage is included in the Philadelphia & Reading this year. The Lehigh Valley tonnage includes the production of the mines of the State Line & Sullivan Co., amounting to 7,060 tons for December; for the year 80,124 tons. In addition to the amount above there were 48,761 tons transported from mines by Delaware & Hudson Canal Co., during December, which is included in tonnage of other interests; total for year 575,247 tons so transported.

For the year ending Dec. 31 the same statement gives the following figures, the New Jersey Central tonnage being included with the Reading for the whole of 1883:

	1883.		1882.	
	Tons.	Per ct.	Tons.	Per ct.
Phila. & Reading... } Central of N. J..... }	12,232,402	38.5	7,000,113 / 4,211,052	24.0 / 14.5
Lehigh Valley	6,271,773	19.7	5,933,740	20.4
Del., Lacka. & Western..	5,079,123	16.0	4,668,717	15.9
Del. & Hudson Canal Co..	3,512,971	11.1	3,203,158	11.1
Pennsylvania R. R.....	2,773,419	8.7	2,232,974	8.0
Pennsylvania Coal Co.....	1,541,145	4.8	1,469,821	5.0
N. Y., Lake Erie & West..	382,194	1.2	330,511	1.1
Total.....31,793,027		100.0	29,120,096	100.0

The total increase for the year was 2,672,931 tons, or 9.2 per cent. A noticeable feature is the closeness with which the several companies have kept up their proportions of the business, the changes being in all cases less than 1 per cent.

The division of the output between the three great subdivisions of the anthracite region was as follows:

	1883.		1882.	
	Tons.	P. c.	Tons.	P. c.
Wyoming Region..... ...15,604,492		49.1	13,971,371	48.0
Lehigh Region.....	6,113,809	19.2	5,689,437	19.5
Schuylkill Region...	10,074,726	31.7	9,459,288	32.5
Total.....	31,793,027	100.0	29,120,096	100.0

The Wyoming Region is the growing section of the anthracite district, from which most of the future increase of production is to be expected, although the Lehigh Region will always maintain a certain standing on account of the peculiar qualities of its coal, giving it special fitness for domestic use.

Eastern competitive tonnage, including all coal which for final consumption or in transit, reaches any point on the Hudson River or the Bay of New York, or which passes out of the Capes of the Delaware was 13,148,185, tons, or 41.4 per cent., of the total, in 1883, against 12,018,764 tons, or 41.3 per cent. of the total in 1882.

Stock of coal on hand at tidewater shipping points Dec. 31 was 748,380 tons, against 696,380 tons on Nov. 30, showing an increase of 51,950 tons, or 7.4 per cent. during the month. Dec. 31, 1882, the stock was 562,116 tons, showing an increase of 186,214 tons, or 33.1 per cent., last year.

Cotton.

Cotton movement for the week ending Jan. 18 is reported as follows, in bales:

	1884.	1883.	Inc. or Dec.		P. c.
Interior markets:					
Receipts.....	46,759	79,508	D.	32,749	40.9
Shipments.....	79,590	91,789	D.	12,199	13.3
Stock, Jan. 18..... ..	360,715	367,967	D.	7,252	2.0
Seaports:					
Receipts.....	110,467	150,390	D.	39,923	26.6
Exports.....	140,822	134,616	D.	6,206	4.6
Stock, Jan. 18.....	1,159,027	922,213	I.	236,814	25.7

The total receipts at interior markets for the cotton year (from Sept. 1) to Jan. 18 were 2,250,449 bales, a decrease of 334,877 bales, or 12.9 per cent.. The total seaport receipts for the cotton year to Jan. 18, were 3,757,674 bales, a decrease of 254,557 bales, or 6.3 ber cent.

Handling Baggage at St. Louis.

The St. Louis *Republican* of Jan. 17 says: "A statement prepared by Mr. Steel, the efficient General Baggage Master at the Union Depot, shows that all the roads running into the city during the year 1883 handled in the aggregate 678,327 pieces of baggage. The Chicago & Alton Railroad Co. handled 79,397 pieces; the Chicago, Burlington & Quincy, 15,840; the Cairo Short Line, 22,316; the Indianapolis & St. Louis, 26,653; the St. Louis, Keokuk & Northwestern, 14,161; the Missouri Pacific, 117,957; the Ohio & Mississippi, 86,348; the Iron Mountain, 66,504; the St. Louis & San Francisco, 30,448; the Louisville & Nashville, 26,453; the Vandalia Line, 68,512, and the Wabash 123,738. The total excess charges amounted to $37,257. A greater amount of baggage was handled in October than during any other month of the year."

Routes to Florida from the West.

A circular issued by the Passenger Department of the Western & Atlantic road gives the following table of routes from Chattanooga to Jacksonville, Fla., which is of interest:

Route No. 1.

	Miles.
Western & Atlantic, Chattanooga to Atlanta.....	138
East Tenn., Virginia & Ga., Atlanta to Jesup.....	236
Sav., Fla. & Western, Jesup to Jacksonville.....	115
Total.	489

Route No. 2.

Western & Atlantic, Chattanooga to Atlanta.....	138
Central of Georgia, Atlanta to Macon.....	103
East Tenn., Virginia & Georgia, Macon to Jesup.....	147
Sav., Fla. & Western, Jesup to Jacksonville.....	115
Total....	503

Route No. 3.

East Tenn., Virginia & Georgia, Chattanooga to Jesup.....	388
Sav., Florida & Western, Jesup to Jacksonville.....	115
Total.....	503

Route No. 4.

Western & Atlantic, Chattanooga to Atlanta..... ...	138
Central R. R., Atlanta to Albany.....	210
Brunswick & Western, Albany to Waycross.....	111
Sav., Fla. & Western, Waycross to Jacksonville....	75
Total	534

Route No. 5.

Western & Atlantic, Chattanooga to Atlanta.....	138
Central R. R., Atlanta to Savannah.....	295
Savannah, Florida & Western, Savannah to Jacksonville....	172
Total	605

Tickets are sold and trains run in connection over all these routes. The Florida travel is reported as showing a considerable increase this year.

Western Trunk Line Association.

It has been agreed that the several New York general agents of the roads forming this Association (the combination of the Union Pacific with the Chicago-Council Bluffs roads) shall form a committee to act on all questions relating to Association business, and that there be no general agent of the Association. Mr. Fred Knowland, long General Eastern Agent of the Union and Central Pacific roads, will act as chairman of the committee, and Mr. H. P. Stanwood, who for about a year has been General Eastern Agent of the California Fast Freight Line, has resigned. The Association Committee will have charge of this line, from which the Burlington will be excluded unless it joins the Association.

The Trunk Lines and the Lackawanna.

In consequence of the order issued by the Trunk Line Commissioner last week the Delaware, Lackawana & Western Co., made application to the New York Supreme Court in Buffalo for an injunction to restrain the New York, Chicago & St. Louis Co. and others from interfering with its through business and refusing to receive its through freight. The usual preliminary injunction and order to show cause was granted. Probably this suit will not be carried any further.

On Jan. 17 the Commissioner directed the enforcement of his order to be suspended, and it was announced that President Sloan, of the Lackawanna, had agreed to a proposition that the difficulties between his company and the trunk lines be submitted to arbitration. Pending the arbitration business will be carried on as heretofore, and through bills of lading will be issued and received.

Decatur, Ill., Pool.

At a meeting of the roads intcrested in the Decatur Pool in Chicago last week the following division of east-bound freight from Decatur was agreed upon: Wabash, 40 per cent.; Illinois Central, 20; Indiana, Bloomington & Western, 16; Peoria, Decatur & Evansville, 10; Illinois Midland, 12. The old per centages were, in the order abovenamed, 36, 20, 19, 15 and 10. Subsequently the Peoria, Decatur & Evansville refused to accept the new division or to be bound by it, as its representative did not reach Chicago until the meeting was nearly over, and took no part in arranging the division.

Southwestern Railway Association Passes.

The following circular has been issued by Commissioner Midgley, of the Southwestern Railway Association:

"Until further notice the following rules will govern the passage of men in charge of live stock, locomotives, etc.:

"Live Stock, west bound—Pass one man in charge of one or two cars; two men in charge of three, four or five cars; three men in charge of six cars or more. Three men to be the maximum number to be passed in charge of any shipment. No return pass. For rules in regard to the passage of men in charge of live stock, east-bound, see east-bound tariffs.

"Locomotives, west-bound—Pass one man in charge of one or more locomotives; return pass to be granted if desired.

"Emigrant Movables, east or west-bound—No pass to be

given unless the car contains horses, mules, cattle, hogs or sheep, in which event pass one man in charge of one or more cars. No return pass.

"Potatoes, Apples, Onions, etc., east or west-bound—Pass one man in charge of one or more cars of potatoes, apples, onions and like freight, when necessary to have fire in the cars to protect contents from frost. No return pass."

The Western Passenger Dispute.

Notice has been received by Assistant Commissioner Pierson from the Chicago, Rock Island & Pacific and the Chicago & Alton railroads that they fully assent to his circular-letter of Dec. 10 last as a basis for agreement with the trunk lines for the control of passenger rates. The roads also expressed their willingness to meet the trunk lines at an early date to complete any necessary details. There is one clause in the circular-letter regarding tourists' agencies to which the Rock Island could not assent, because of a contract now existing between it and one of the agencies. The roads will continue, it is said, to pay commissions to the regular agents or any one else they may elect. It is said, however, that nothing in the nature of the contract will tend to demoralize rates, and this part of the agreement will be subject to future negotiations. The other Iowa lines that have been working with the pool roads have signified their assent to the basis of agreement. In consequence of this the Commissioner has instructed the trunk lines to resume the sale of the Rock Island and Alton ticket issues, taken off on account of cutting of rates, and to restore schedule rates.

Hoosac Tunnel Dispatch.

This new fast freight line has been organized to run over the Fitchburg Railroad, the Troy & Boston, the Delaware & Hudson Canal Co. lines, the New York, Lake Erie & Western, the Grand Trunk west of Buffalo and its western connections. The new line is organized in consequence of the withdrawal of the Vanderbilt roads from the old Hoosac Tunnel line.

RAILROAD LAW.

The Liability of Carriers.

In Baltimore, Jan. 15, Judge Morris, of the United States Circuit Court, filed an opinion in the case of J. W. Scott *vs.* Odell, Ragan & Co., and Purcell, Ladd & Co. *vs.* The Baltimore, Chesapeake & Piedmont Steamboat Co., which has some interest to shippers and insurance companies. The decision was for the defendant, and is given in the Baltimore *Evening News*, as follows: "These cases arise out of the fire on the wharf of the York River line of steamboats, which occurred about 5 o'clock on the morning of Dec. 22, 1877. The goods sued for had been delivered by the shippers during the day before the fire, with the expectation that they would be taken by that day's boat. There was a conflict of testimony as to whether they were delivered before 3 o'clock or not, as after that hour it was known no freight could be put on board that day's boat. The Judge holds this question to be immaterial, as the detention did not cause the fire, and therefore under decisions of the Supreme Court, the loss by fire not being a result reasonably to be anticipated as a result of the delay, the delay cannot be said to be the cause of the loss. The only question, he continues, is, did the bills of lading exempt the company from loss by fire? They contain the words, 'dangers of the seas, fire, leakage, breakage, accident to machinery etc., excepted.' It was contended that this language was not explicit enough to exempt goods on the wharf, but the Court holds that, as the company's liability as carriers commenced from the moment the goods were received by it, the fair construction of the bill of lading is that the exemption from fire is as broad as the liability, and the fire having occurred without fault of the company, it is not responsible."

Liability of Company for Incompetent Employe.

In Kersey against the Kansas City, St. Joseph & Council Bluffs Co., the Missouri Supreme Court lately held as follows:

A master is not liable for an injury to a servant, caused by a locomotive in charge of an incompetent engineer, running over him, when there has been no negligence on the part of the engineer, although his incompetency was known to the defendant. To sustain an action of this character the plaintiff must prove (1) negligence of the fellow servant, (2) knowledge of his incompetency. Proof of either alone is not sufficient.

Damages for Injury in Coupling Cars.

In the case of Charles DeKay, a railroad employé, *vs.* the New York, Lake Erie & Western Co., an action which was brought to recover damages for personal injuries received while in discharge of duties, the jury gave a verdict for the plaintiff for $5,000, to which the Court added an allowance of 5 per cent.

The Port Jervis *Gazette* gives the following particulars: "In December, 1880, DeKay was employed as a brakeman on the Erie, and while making a coupling at Otisville had one of his hands so badly mangled that amputation of half of it became necessary. Mr. DeKay claimed that the coupling was defective, inasmuch as one of the cars had a hook drawhead with two bumpers, whereas the other car was supplied with an ordinary drawhead and no bumpers. When he attempted to make the coupling the draw-head of one car mounted the hook of the other, and pinned his hand against the side of the car. The defense was that plaintiff was guilty of contributory negligence in not seeing the condition of the cars; that the cars were in good condition but mismatched on the Erie road (one of them being a Lehigh Valley car). The case was hotly contested on both sides and elicited a great deal of attention.

OLD AND NEW ROADS.

Addison & Northern Pennsylvania.—This road is now doing a considerable business both in freight and passengers. It has been brought into good condition by much labor, the present Superintendent, Mr. Frank M. Baker, having taken charge of it when just opened and very hastily built. The maintenance of a good track is of special importance on this road, as it has sharp curves and steep grades, and a large part of its business is done in standard-gauge car bodies, which are hauled over the road on narrow-gauge trucks.

Baltimore & Ohio.—This company has bought the Buckeye Car Works property in Columbus, O., and will convert the works into a shop for the repair and construction of cars for the Trans-Ohio divisions.

The Baltimore *Day* says: "Some idea may be formed of the immense business which is now being done over the Baltimore & Ohio Railroad Co.'s lines when it is stated that 24 standard box cars and 12 iron cars, each having a carrying capacity of 40,000 pounds, are turned out of the shops at Mount Clare alone weekly. In the locomotive shops 4 first-class engines are built monthly, and if the works are run to their fullest capacity 5 can be produced. This is in striking contrast to the work performed a few years ago, when it was considered that the shops were doing remarkably well to build one locomotive in two months."

Birmingham Mineral.—A contract to build this road has been let to George L. Morris & Co., of Birmingham, Ala. The road will have two branches, one from the South & North Alabama just north of Grace's Gap to the Sloss Mine, 7½ miles, the other from the same road two miles further south to Red Mountain, 2½ miles.

Bluffton & Logansport.—This company has been organized to build a railroad from Logansport, Ind., eastward through Bluffton to the Ohio state line in Adams County. The distance is about 85 miles.

Boston & Albany.—The Boston *Advertiser* of Jan. 21 says: "The directors have voted not to accept the conditions imposed by the City Council of Newton, in giving the right of way through the city poor farm for the proposed Newton Circuit Railroad. The conditions required the Albany road to build two bridges, which would cost from $10,000 to $15,000, and required the road to be completed within one year. It is said to have been the intention of the Albany to begin work as early in the spring as possible, and to complete the line in seven months, but the directors apparently think they ought not to be dictated to, even if they are allowed several months leeway on the time they considered necessary."

Boston, Winthrop & Shore.—At a meeting held in Boston, Jan. 22, it was voted to increase the capital stock to $275,000, to be issued by the directors as funds may be needed. The issue of $275,000 in bonds, to take up all existing bonds and complete and equip the road, was also authorized. The managers think that the total cost of their undertaking will fall below $400,000. The entire line, with the ferry, will be open to the public some time in June, and the line from Winthrop Junction to Point Shirley early in February.

Boston Elevated.—The application for a charter to build an elevated railroad in Boston on the Meigs one-rail system, which was rejected by the Massachusetts Legislature last year, has been renewed, and the Railroad Committee is now hearing arguments for and against the bill.

Buena Vista.—Surveys have been begun for this road from Buena Vista in Marion County, Ga., eastward to Oglethorpe on the Southwestern Division of the Central Railroad. The distance is about 28 miles.

Cape Fear & Yadkin Valley.—The track on this road is now reported laid to a point four miles northwest of Liberty, N. C., and 78 miles from Fayetteville, leaving about 20 miles to reach Greensboro. On the southern extension of the road the trestle bridge over Rockfish Creek has been finished, and track laid to Rockfish Village, 8 miles from Fayetteville. Work is progressing steadily.

Central, of Georgia.—This company has decided to give up the use of wood as fuel on the Atlanta Division, and the locomotives will be changed to coal-burners as fast as possible.

Central Vermont.—In St. Albans, Vt., Jan. 17, a hearing on the report of the masters on the accounting of the Central Vermont receivership was had before Chancellor Royce. The report finds that the receivers and managers operated the roads under their charge in good faith and with prudence, and that the relations between the trust and roads operated by the Central Vermont Co. and the business methods pursued, have been fair and equitable. It also approves the services and management of the trust property by Hon. J. G. Smith, and allows his account. B. F. Fifield, for the Central Vermont, moved the acceptance and confirmation of the report, and asked for an order to that effect. Counsel for the other parties were present, but no objection was made to the aforesaid acceptances, and the order was made, the accounts being adjudged settled and closed. In the old case of the Vermont & Canada *vs.* the Vermont Central Railroad, pending since 1855, on a full hearing, the Court made an order discharging the receivers and managers, and ordering them to turn over to the Consolidated Railroad Co. of Vermont the railroads and equipments and assign all personal property and assets of every kind: also to make a full inventory of the same to Court, the Court retaining control of the property for the time being, until the inventory is completed, and the accounts of the receivers and managers for six months, between July 1, 1883, and Jan. 1, 1884, are settled; the Consolidated Co. to assume and execute all contracts and leases authorized by the Court, or being on the property of the receivers, and to execute a covenant to the satisfaction of the Court for the performance of this order. The Court retains the property under its control until this order is complied with. Subsequently a notion came up to dismiss the case of Langdon *vs.* the Vermont & Canada Railroad and others, the motion being made by the Central Vermont Railroad Co. After a hearing on this subject, it was adjudged by the court that said suit and all proceedings thereunder be dismissed without prejudice. This ends the receivership and litigation of 29 years' standing.

Chester & Lenoir.—Trains on this road now run through to Hickory, N. C., 89⅛ miles from the southern terminus at Chester, S. C. The road was completed to Newton, 79 miles from Chester, some months ago, and a third rail has lately been laid on the Western North Carolina road from Newton to Hickory, 10¼ miles, to accommodate the 3 ft. gauge of this road. From Hickory northwest to Lenoir, 20 miles, the grading is nearly finished. Tracklaying was lately begun, and the rails are now down for three miles from Hickory.

Cincinnati, New Orleans & Texas Pacific.—This company did not pay the $200,000 quarterly rental due on Jan. 12. It is understood that the company claims that it has 90 days' grace in which to make the payment and that the delay does not arise from any financial trouble. At a meeting of the City Council last week attention was called to the delay, and it was charged that the company was withholding the money in order to make the interest. No action was taken, however, the matter being postponed on receipt of a message saying that it would be attended to at once.

Condersport & Port Allegheny.—This short local line, which extends from Condersport, Pa., to Port Allegheny, 17 miles, has been unusually successful for a road of its class. A local paper says of the statements made at the annual meeting last week: "The business of the company is satisfactory. The road is owned entirely by the stockholders, has no bonded debt, and no floating debt except bills which are promptly paid at the end of the month, and is paying a fair interest on the money invested."

Connotton Valley.—An application was made to the Court of Common Pleas at Massillon, O., Jan. 19, for the appointment of a receiver, by the New England Trust Co., of Boston, as trustee. The Court granted the application at once and appointed to the position Mr. Samuel Briggs, the General Manager of the road. It is understood that this is the beginning of foreclosure proceedings.

The road is of 3 ft. gauge and extends from Cleveland, O., to Coshocton, 115 miles, with 46 miles of branches. By the latest statement the bonded debt consisted of $5,578,000 consolidated bonds and $147,000 old bonds which were to be exchanged for consolidated bonds. Interest has been in default since November, 1882, when the company offered to fund coupons in scrip. The terminal property in Cleveland is owned by a separate organization and covered by a separate organization, and the equipment is chiefly held under car trusts. The road was the outgrowth of a short coal branch, originally known as the Carrollton & Oneida, and was intended to be chiefly a coal road, but has not so far been successful. It is still incomplete, as an extension from Coshocton to Straitsville, 70 miles was intended. The bonded debt, as stated above, is about $37,000 per mile; the earnings have not been reported regularly, but it is understood that they do not much exceed the working expenses.

Delaware & Hudson Canal Co.—A contract has been let to W. J. Curtis, of Saratoga, N. Y., and J. Whalen, of Cobleskill, to build a second track from Mechanicsville to Ballston Spa station.

Denver & New Orleans.—In Denver, Col., Jan. 17, this company filed a complaint in the United States Court against the Union Pacific Railway Co. for $1,000,000 damages, claiming that the latter road refuses to exchange passengers and freight, and has entered into a contract with the Denver & Rio Grande Co. to break it down.

Detroit, Bay City & Alpena.—The high bridge over Rifle River has been completed, making the track continuous from Wells, Mich., to Au Sable and avoiding the transfer heretofore necessary at the bridge.

Fargo Southern.—Mr. H. E Sargent, President of this company, makes a statement under date of Jan. 1 showing that this company has received $288,450 from stock and $20,000 from loans. Up to date there had been expended for construction $400,209, leaving $8,241 on hand. The statement further says:

"There is due Jan. 10, as per contract, for steel rails, $28,532; for one hundred new freight cars, $43,000; for balance on steel frogs, $252; for short loan, $20,000; also for freight on 90 carloads of track material withheld by the Manitoba Railroad, about $10,000, amounting in all to $101,784, and the money will be in the banks on the 10th instant, that all of the above can be paid in cash.

"The issues illegally made by the Manitoba Railroad arising out of the Wahpeton crossing were all settled satisfactorily on Dec. 28.

"The road-bed is graded the entire distance between Fargo and Ortonville. Seventeen miles of main track are laid at the Fargo end and 10 miles at the Ortonville end, besides necessary sidings for the time.

"The principal bridges are completed and in place, there remaining three others of light character to put in, the material for which is partially on the ground and paid for; in addition to this is the pile bridge 1,200 ft. long, across the slough at Fargo, made necessary by extending the line directly into the city.

"There is on the line properly distributed for early work in the spring (including that in track), ties, 41 miles; steel rails, 55 miles; spikes, 85 miles; fastenings, 101 miles. Favorable contracts are made for spring delivery of sufficient ties to complete the road."

Florida Central & Western.—This road has passed under the control of the Florida Transit & Peninsular Co., and hereafter will be operated by that company and under the management of the same officers.

Florida Southern.—The Ocala Division of this road is now in operation to Leesburg, Fla., 16 miles southward from the late terminus at Lake Weir, and 66 miles from the junction with the main line at Gruelle. The track on this extension was all laid last year.

Grand Forks, Crookston & Lake Superior.—This company has been organized to build a railroad from a point at the head of Lake Superior across Minnesota to the Red River at the mouth of Red Lake River, with branches to the mouth of Wild Rice River, to Turtle River and southwest into Polk County. The incorporators are residents of Crookston and Grand Forks.

Grand Trunk.—It is stated that this company will make application to the Dominion Parliament for an act to incorporate a company to build a tunnel under the St. Clair River from Sarnia to Port Huron.

Jersey Shore, Pine Creek & Buffalo.—At the annual meeting last week the stockholders voted to change the name of the corporation to the Pine Creek Railroad Co. The road is leased to the Fall Brook Coal Co., and is the line built last year to connect the Philadelphia & Reading with the New York Central road.

Kanawha Valley.—This company has filed articles of incorporation in West Virginia to build a railroad from Parkersburg by the most practicable route through the counties of Wood and Wirt, passing through or near Wirt Court-House, thence by the most practicable route to a point at or near Spencer, Roane County, thence by the most expeditious route through the counties of Calhoun and Gilmer, by way of Glenville, to Weston, Lewis County. The capital stock is $3,000,000. The line proposed is about 70 miles long, chiefly through the Valley of the Little Kanawha,

Lanesboro, Rochester & St. Paul.—This company has been organized to build a railroad from the Iowa state line in Fillmore County, Minn., northward through Lanesboro and Rochester to St. Paul. The headquarters of the company will be at Lanesboro, Minn. The capital stock is fixed at $1,000,000.

Louisville & Nashville.—This company has made the following statement for the half year from July 1 to Dec. 31:

Gross earnings		$7,761,941
Expenses (58.3 per cent.)		4,522,018
Net earnings		$3,239,923
Other receipts		130,482
Total		$3,370,405
Interest and rentals, six months	$2,126,962	
Taxes	170,000	
		2,296,962
Surplus income		$1,073,443

As compared with the corresponding half of the previous year, there was an increase of $901,408, or 13.1 per cent., in gross earnings, and an increase of $333,556, or 7.9 per cent., in expenses, leaving a gain in net earnings of $567,852, or 21.3 per cent. There was a very large increase in the surplus income.

Maryland Central.—At the annual meeting in Baltimore, Jan. 21, the report presented by the directors showed that the road had been completed to Delta, 45 miles distance from Baltimore. Depots have been erected at Delta, Waterville and Belair. The pavilion at Loch Raven is now completed, and water tanks have been constructed at

Waterville, Loch Raven and Belair. The rolling stock owned by the company at present consists of 6 locomotives, 31 passenger cars, 70 box, 3 stock cars, 11 flat, 6 push cars, 1 hand car and 1 caboose. It is expected that the rolling stock will have to be increased during the year in order to promptly handle the traffic. In 1880 the company ran short of funds, and in order to complete the road a first mortgage was executed on the property, and bonds to the amount of $600,000 were issued thereunder. Brown & Lowndes, bankers, contracted with the President to sell these bonds, but failed to do so. Mr. Wm. Gilmor, then Vice-President of the company, offered to sell the bonds if the contract with Brown & Lowndes was abrogeted and he given a similar contract. This proposition was accepted, and Mr. Gilmor, having resigned his position as Vice-President, was appointed agent to dispose of the bonds. The contract between the company and Mr. Gilmor entitled any one who would subscribe to the capital stock of the company and pay up his subscription in full to take bonds to the amount of $100 for each share of his stock at such a price as would, when added to the par value of the stock, be equivalent to the minimum price fixed on the bonds by the company.

The contract further provided that the sale of the bonds should net the company not less than 85. Within 15 days after signing the contract (which was on June 14, 1881) Mr. Gilmor sold bonds to the amount of $100,000. Altogether, Mr. Gilmor has disposed of bonds to the amount of $399,500, and this money was used in completing and equipping the road. Additional funds are required for further improvements, and it has been determined to issue second-mortgage bonds to the amount of $300,000.

The report of John T. Ayers, an expert accountant appointed to investigate the financial condition of the company, showed that the construction of the road cost from 1878 to 1884 $696,954. The equipment during the same period cost $160,382. On the second-mortgage bonds there has been loaned to Jan. 1, 1884, $144,500. The net profits for the last eight months of 1882 amounted to $4,707. The receipts from freight and passenger traffic for the year 1883 were $73,752; miscellaneous, $552. The expense account for the same year was $40,092. The discount and interest on loans for the same year amounted to $10,676, the net profit, $23,535, being applied to pay the year's coupons on $399,500 first-mortgage bonds. Of the first-mortgage bonds there has been sold up to Jan. 1, 1884, $399,500. In the Safe Deposit Co. are $10,000, and $190,500 have been hypothecated. The floating liability of the company is $39,553. On Jan. 1, 1884, there was issued and not transferred 1,744 shares of Baltimore & Delta stock and 10,211 shares of Maryland Central stock, making a total of 11,955 shares.

The election resulted in the continuance in office of the old directors, although they were opposed by many of the small shareholders, who claim that the controlling interest in the stock has been secured by certain parties without consideration.

The completion of this road to Delta, Pa., 45 miles from the starting point in Baltimore, was celebrated by an excursion over the road last week, to which a large number of persons were invited. At Delta the road connects with the York & Peachbottom, making a new line from Baltimore to York. It will serve locally a considerable population, and will also serve as an outlet for the large slate quarries at Delta. The regular trains began to run to Delta, Jan. 21.

Memphis, Selma & Brunswick.—In the United States Circuit Court at Oxford, Miss., Jan. 22, judgments to the amount of $311,000 were entered against this company in favor of Green, Hamilton & Co., contractors, the Indianapolis Rolling Mill Co. and others. The road will probably be sold to satisfy them.

Mexican Central.—The gross earnings of this road by months in 1883 were as follows:

	Southern division.	Northern division.	Both divisions.
January	$147,107	$15,618	$162,724
February	135,862	12,269	152,131
March	151,286	17,075	168,367
April	160,427	26,471	186,898
May	133,684	24,516	158,200
June	135,594	23,153	178,727
July	86,765	23,276	110,045
August	128,108	29,533	157,700
September	125,525	28,223	153,748
October	137,876	44,902	182,780
November	137,115	39,340	176,455
December	144,473	48,192	192,664
Total	$1,623,368	$336,568	$1,960,436

The mileage worked on the Southern Division was 306 miles from Jan. 1 to Aug. 31, and 346 miles from Sept. 1 to Dec. 31, making an average of 319.3 miles. On the Northern Division the road worked was: Jan. 1 to July 31, 225 miles; Aug. 1 to Oct 7, 371; Oct. 8 to Dec. 31, 515 miles, making an average of 21.8 miles for the year. This gives the earnings per mile for the year as follows: Southern Division, $5,090; Northern Division, $1,045; average for the whole line, $3,058. No comparison with 1882 can be made, on account of the great changes in mileage.

Mexican Railroad Notes.—The following notes are from the *Mexican Financier* of Dec. 29:

Mr. W. W. Nevin, Secretary of the Mexican National Railway Co., reports the total amount of mileage finished on all the lines of the Mexican National as 875.38 miles, or 1500.6 kilometers.

It is beginning to look like energetic work on the Pacific Division of the Mexican Central, as considerable amounts of material are coming in at San Blas. On Dec. 19 a second vessel arrived, the American bark "E. L. Petengill," with rails, locomotives, cars, etc., for the railway.

Mr. Alfredo Poett, the civil engineer, has pronounced very favorably upon the prospects of the projected railway from Mazatlan to a junction with the Pacific Division of the Mexican Central, for which Gen. Carbó has the concession. It would pass through a rich country all the way, with agriculture already largely developed and assuring a good local traffic from the start. The grade would be nearly level and the cost low.

Now that the English scheme to take the Mexico & Túxpan Railway and push it to completion has fallen through, the Mancera concession, as it is called, is in the market again. It is said that Count Telfener would like to get it, broaden the gauge of the line and make it a part of his system, but regards the price as too high. American parties are also reported to be negotiating for the concession. It is the heaviest-subsidized narrow-gauge project in Mexico.

Milwaukee, Lake Shore & Western.—The directors have decided to build about 85 miles of road this year, which will complete the main line to Lake Superior and build a number of branches in the Agogebic iron district.

Missouri Pacific.—In St. Louis Jan. 13, the Circuit Court sustained the demurrer interposed in the suit brought by Nelson and others, judgment creditors, to set aside the foreclosure and sale under which the Pacific Railroad, of Missouri, passed to the present company, and dismissed the bill, thus affirming the validity of the foreclosure.

Nashville, Chattanooga & St. Louis.—This company makes the following statement for December and the half-year from July 1 to Dec. 31:

	December.		Six months.	
	1883.	1882.	1883.	1882.
Earnings	$209,999	$210,675	$1,226,905	$1,181,533
Expenses	115,828	107,304	649,365	653,618
Net earn.	$94,171	$103,371	$577,540	$527,915
Interest and taxes			331,825	324,837
Surplus income			$245,715	$203,078

For the six months this shows an increase of $45,372, or 3.8 per cent., in gross earnings; a decrease of $4,253, or 0.6 per cent., in expenses; an increase of $49,625, or 9.4 per cent., in net earnings, and a gain in surplus income of $42,637, or 21.0 per cent.

New York, Danbury & Boston.—This company has made a contract with S. M. Sullivan for the construction of the road from the Harlem River at Second avenue, New York, by way of Portchester to Danbury, Conn., where connection will be made with the New York & New England road. For a part of the distance the old road-bed graded for the Portchester & Ridgefield road several years ago will be used.

New York, Lake Erie & Western.—The following statement from this company gives the earnings and expenses for October, the first month of the fiscal year:

	1883.	1882.	Increase.	P. c.
Earnings	$2,411,146	$1,819,010	$592,136	32.6
Expenses	1,567,778	1,175,681	392,097	33.4
Net earnings	$843,368	$643,329	$200,039	31.1
Per cent. of exps.	65.0	64.6	0.4	....

As heretofore the earnings include 68 per cent. of the gross earnings of the leased New York, Pennsylvania & Ohio road, while the expenses include all the working expenses of the leased line, the 32 per cent. of the gross earnings of that road not appearing in the accounts at all.

New York & Connecticut Air Line.—Officers of this company state that contracts have been let for the construction of the road from New Haven, Conn., to the New York state line, and that work will soon be begun.

New York & New England.—In the case of Mason and others against the Hartford, Providence & Fishkill Co. and others, the United States Circuit Court in Boston filed a decision on Jan. 18. This is a bill of reviver and supplement, filed by the administrators of Earl P. Mason, to revive a suit abated by his decease, and to bring in as defendants parties who have succeeded to the interest of some of the original defendants. The object of the original suit was to enforce against that part of the Boston, Hartford & Erie Railroad in the states of Rhode Island and Connecticut which was formerly the Hartford, Providence & Fishkill Railroad Co., a lien claimed by the plaintiff to exist, on account of certain preferred stock issued by the latter company in 1854, the certificates of which stock contained a clause that the par value thereof was demandable by the holder, from the company at any time after April 1, 1865, a demand of payment having been made on the company in March, 1871. The bill of reviver prays that the original suit may be revived for the benefit of the administrators. To this bill the New York & New England Railroad] filed a demurrer to part and a plea to the [residue, and three other defendants filed a plea to the whole bill. The case was heard upon pleas, demurrer and certain agreed facts. A decision has now been given, overruling the pleas and demurrer. The Court hold that the jurisdiction in this case does not depend upon the citizenship of the parties, but that under Revised Statutes, section 4979, the Court has jurisdiction to determine the validity of a lien and enforce it against the property. It was also held that there had been no waiver of the plaintiff's rights and no laches on the part of the plaintiffs.

It is understood that the Receiver will shortly make a considerable reduction in the number of officers by consolidation of several departments and reduction in the number of employés of others. Some changes will also be made in operating the road. The present division of the main line into two divisions, extending respectively from Boston to Hartford and from Hartford to the Hudson, each over 100 miles, is to be changed, and the Eastern Division will extend from Boston to Willimantic, 86 miles, the Central Division from Willimantic to Waterbury, 64 miles, and the Western Division from Waterbury to the Hudson, 78 miles.

A motion is pending before Judge Shipman of the United States District Court at Hartford for permission to bring suit in behalf of the Treasurer of Connecticut against the Receiver for taxes overdue. There will be a hearing on the motion on Saturday, Jan. 26. At the time the Receiver was appointed papers had been made out to commence suit for the overdue taxes. The amount of these taxes is about $100,000, and the Receiver has petitioned the Legislature for their abatement, on the ground that the road is not able to pay.

New York, Ontario & Western.—The applications of Conrad N. Jordan and R. H. Chipman for the appointment of a receiver for this road came up before the United States Circuit Court in New York, Jan. 19, and Judge Wallace then agreed to hear arguments in the case at Syracuse, Jan. 24. Whether the receivership will be ordered or not is entirely uncertain.

The board has re-elected all the old officers, except that Assistant Treasurer Nisbet takes Mr. Jordan's place as Treasurer.

New York, Philadelphia & Norfolk.—This company has secured two years' extension of time in which to complete its road from the Maryland line in Accomac County, Va., to Cherrystone.

New York, West Shore & Buffalo.—A number of attachments and builders' liens have been put on property of this company, chiefly on the shops at Frankfort, N. Y., by contractors who have done work on the road or furnished materials. Liens have also been filed on the terminal property at Weehawken. These do not necessarily mean that payment is to be pressed, but that contractors wish to secure their prior claims.

Judge Green, Receiver of the New York Construction Co., has asked the directors of the West Shore Co. to consent to an arbitration of the accounts between the two companies. In accordance with this suggestion the board appointed a committee to select three independent and disinterested persons, whose appointment should be confirmed by the board—one to be a lawyer, one an engineer, and one a competent accountant—to examine and report upon the account between the railway and the construction companies. The object is to secure a friendly settlement of accounts in the shortest possible time.

Northern Pacific.—Sealed proposals will be received at the office of A. Anderson, Engineer in Chief, in St. Paul, Minn., until Feb. 12 next, for clearing, grubbing, grading, bridging and furnishing ties for about 60 miles of the Cascade Branch, from the present end of the track, 25 miles west of Wallula, to Yakima, Wash. Ter. Maps, profiles, etc., can be seen and blank forms obtatned at the office in St. Paul.

The election of Mr. Robert Harris as President of the road is noted elsewhere. The choice appears to be generally approved by those interested in the company.

Ohio & Guyandotte.—The contract for building this road has been let to a concern known as the New York Construction Co., which is to receive its pay in the securities of the company. The road is to run from the Ohio River at Ceredo, W. Va., southeast about 50 miles to the coal deposits on the Guyandotte River. It will pass through a heavily timbered region with very few inhabitants.

Ohio & Mississippi.—In the suit of Dimpfel and others against this company, which was brought to set aside the purchase by this company of the Springfield & Illinois Southeastern road, now known as the Springfield Division, the United States Supreme Court has finally affirmed the judgment of the Circuit Court, holding that the complainants have not shown any ground which would justify the Court in inquiring into the validity of the transaction. This decision finally affirms the validity of the purchase.

Oregon & Transcontinental.—President Endicott publishes a denial of the reprts that this company has been selling such of its Northern Pacific stock as was not hypothecated for the syndicate loan. He says that the company has sold no stock.

Pennsylvania.—This company's statement shows for December, as compared with the same month in 1882, on all lines east of Pittsburgh and Erie:

A decrease in gross earnings of	$316,659
A decrease in expenses of	315,034
Net decrease	$1,625

For the year ending Dec. 31, as compared with 1882, the same lines show:

An increase in gross earnings of	$2,003,418
An increase in expenses of	1,099,745
Net increase	$903,673

Carrying out these comparisons, we have the following statements for December and the year:

December:	1883.	1882.	Inc. or dec.		P. c.
Earnings	$3,840,579	$4,157,238	D.	$316,659	7.6
Expenses	2,657,292	2,972,326	D.	315,034	10 6
Net earnings	$1,183,287	$1,184,912	D.	$1,625	0.1
Year:					
Earnings	$51 083,051	$49,079,633	I.	$2,003,418	4.1
Expenses	31,746,949	30,647,204	I.	1,099,745	3.6
Net earnings	$19,336,102	$18,432,429	I.	$903,673	4.9

All lines west of Pittsburgh and Erie for the 12 months of 1883 show a surplus over all liabilities of $803,848, being a decrease of $1,090,452, as compared with the previous year.

Quincy & Ottumwa.—It is proposed to build a narrow-gauge railroad from West Quincy, Mo., northwest to Ottumwa, Ia., a distance of about 100 miles. A similar project has been brought up before, but without success.

South Florida.—On the extension of this road the track is now completed to Tampa, Fla., 66 miles beyond the old terminus at Kissimee, completing a line 106 miles long from Sanford on the St. Johns River to Tampa on the Gulf, the first line which has reached Tampa Bay, although it is the intended terminus of several.

St. Paul, Minneapolis & Minnetonka.—This company has been organized to build a railroad from St. Paul, Minn., by Minneapolis, Lake Harriet and Lake Calhoun to the Hotel St. Louis, on the east side of Lake Minnetonka. A branch to the Mississippi near St. Anthony's Falls is also proposed. It is intended as a line for suburban and pleasure travel.

Sharpsville.—At the annual meeting last week the Pierce party of local stockholders was successful in retaining control of this company, in spite of the efforts of the opposition, which is headed by Mr. Wm. L. Scott, of Erie, and has fought for the control of the road for several years.

Texas & St. Louis.—The receivership has been extended to Texas by the concurrent action of the United States Circuit Court for that district. The suit brought by the Central Trust Co., of New York, is for foreclosure of mortgage, and the Receiver is appointed pending further proceedings. It is understood that a foreclosure and sale of the road will be necessary in order to carry out the plan of reorganization as proposed and adopted by a majority of the bondholders.

Toledo, Cincinnati & St. Louis.—On Jan. 19 Judge Drummond, in the United States Circuit Court, at Chicago, entered a decree authorizing the Receiver of this road to issue receiver's certificates, bearing 6 per cent. interest, to the amount of $110,000, to pay the amount due contractors for the construction of that portion of the road between Kokomo and East St. Louis. This perfects the title in the mortgage, the certificates remaining, however, the first lien on that portion of the road lying between the two cities named. It is understood that the Boston committee has arranged to take the certificates.

Receiver Craig makes his first monthly report, for November, as follows:

Received from all sources	$35,249
Disbursements	3,237
Cash on hand, Dec. 1	$32,012

Payments made were all on accounts originating under the receivership.

Utica & Black River.—Reports have been in circulation that certain parties have been buying up the stock of this road to secure control, for what purpose is not known. Recently Mr. Hutchinson, of Utica, applied at the company's office to look over the stock books. He was refused access to the books, and thereupon applied to the Supreme Court for a writ of *mandamus* to compel the officers of the company to permit the books to be seen. The case has not yet been decided.

Western & Atlantic.—This company is now running a through day coach between Chattanooga and Jacksonville, Fla., by way of Atlanta, Macon, Albany and Waycross, running over the Western & Atlantic, the Central of Georgia, the Brunswick & Western and the Savannah, Florida & Western roads. This car makes the run of 534 miles in 25½ hours, leaving Chattanooga at 8 a. m., and reaching Jacksonville at 9:30 a. m, on the next day—an average speed of 21 miles an hour, without allowance for stops.

Wrightsville & Tennille.—Surveys are in progress for this road from Wrightsville in Johnson County, Ga., north by west to Tennille on the Central Railroad. The distance is about 20 miles.